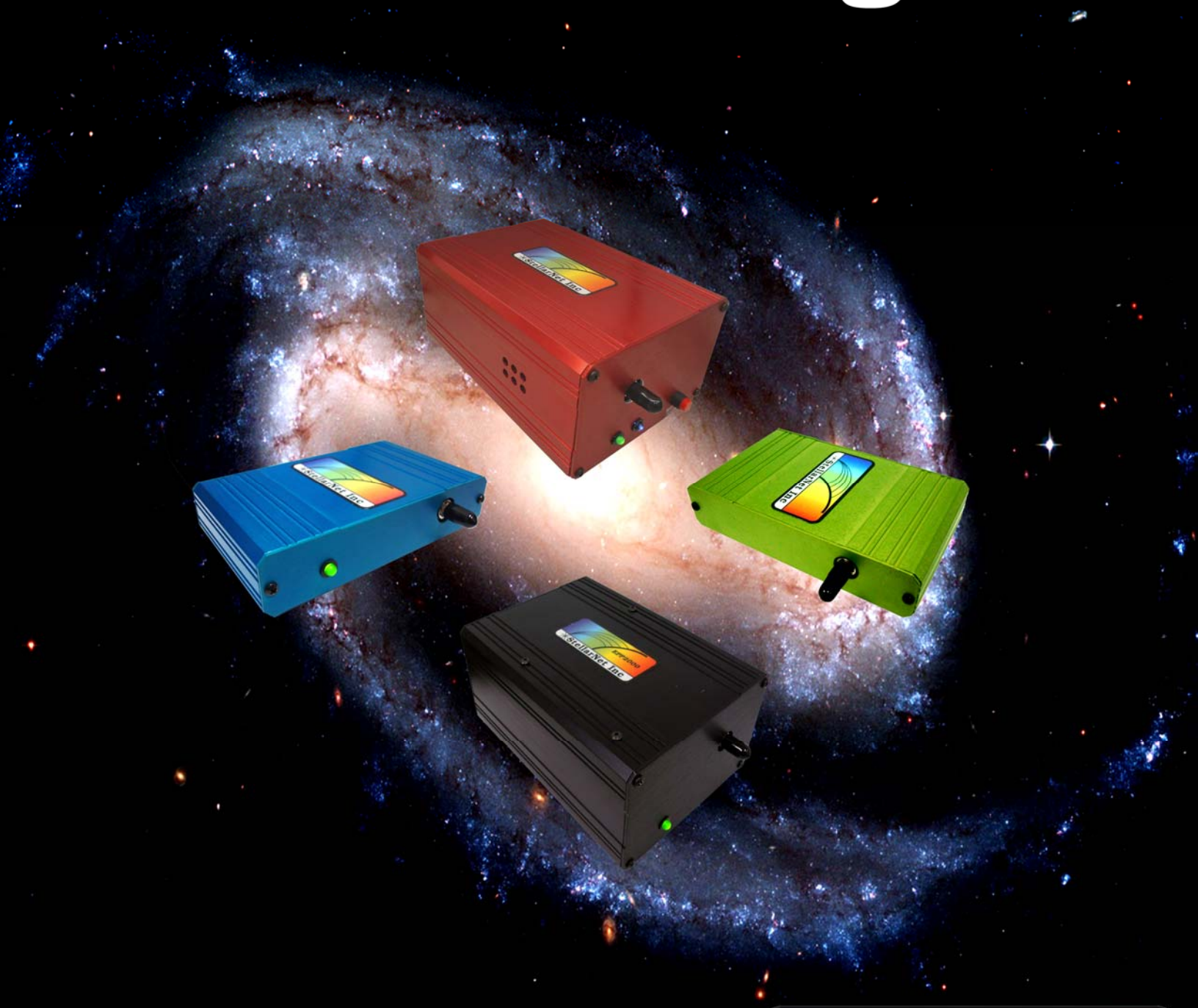
StellarNet Product Catalog



StellarNet Inc

Table Of Contents

Spectrometer Measurement Systems 4-23

4 SpectroChemistry - UV-VIS-NIR absorbance, chemical concentrations
6 SpectroColorimetry - Color analysis of solids & liquids; CIELAB L* a* b* ΔE
8 SpectroRadiometry - Absolute intensity light measurements
10 LED Measurement Systems – Color, intensity, CIE 1931 xy chromaticity
11 SpectroFluorimetry - Low cost LED excitation & cooled CCD detection
12 PORTA-LIBS - Elemental analysis of solids and powders
14 Thin Film Metrology - Non-contact reflectance to measure film thickness
16 Optical Metrology - Spectral analysis of optics samples and filters
17 ChemWiz ADK – Multivariate Chemometric Analysis
19 Raman Spectrometers – High sensitivity in tiny rugged enclosures
20 RamuLasers – Compact, rugged Raman lasers for 785/830/1064nm
21 Raman Accessories – Adjustable and OEM Raman lasers

Miniature Fiber Optic Spectrometer 24-38

24 Spectrometer Line Up with UV-VIS and NIR detectors (CCD/PDA/InGaAs)
25 BLACK-Comet Concave Grating Spectrometers (190-1100nm)
27 BLUE-WAVE 16-bit OEM Compact Spectrometers 15 models 200-1100nm
29 GREEN-Wave Low Cost Compact Spectrometers 350-1100nm
31 DWARF-Star NIR Spectrometers 512/1024 element InGaAs for 900-1700nm
33 RED-Wave NIRX Spectrometer with 512/1024 element InGaAs for 900-2300nm
35 Dual-Detector Super Range (DUAL-DSR) CCD + InGaAs PDA 200-2300nm
36 High Resolution Plane Grating Spectrometers for 200-1100nm
37 UVN-Super Range High Resolution Spectrometer for 200-1100nm

Light Sources 39-44

39 SL1 Tungsten Halogen Light Source for VIS-NIR
40 SL1 LED Excitation Sources
41 SL2 Wavelength Verification Standard
42 SL3 Deuterium Light Source for UV
43 SL4 High Power Deuterium & Tungsten Light Source for UV-VIS-NIR
44 SL5 Low Power Deuterium & Tungsten Light Source for UV-VIS-NIR

Fiber Optic Cables 45

Sampling Accessories 46-53

46 Fiber Optic Reflectance probes and fixtures
48 Fiber Optic Fixed & Adjustable Transmission / Reflectance fixtures
50 Cosine Receptors
51 Integrating Spheres for SpectroRadiometry
52 Fiber Optic cuvette holders
53 Fiber Optic Dip Probes

Table Of Contents

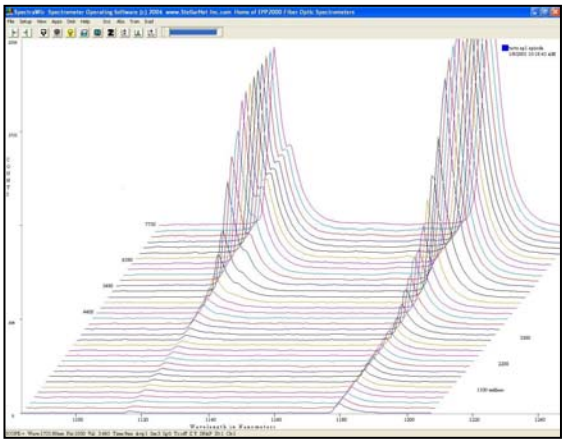
NIST Traceable Calibration Service *for Spectroradiometry …….. 54*
Battery Packs for Field Operation ……..…… 55

Software (included free) ……..56
56 SpectraWiz spectroscopy platform with many built-in applications
58 SpectraWiz-LabVIEW fully customizable source diagrams
59 SpectraWiz-VBA includes full source for user customization of Excel

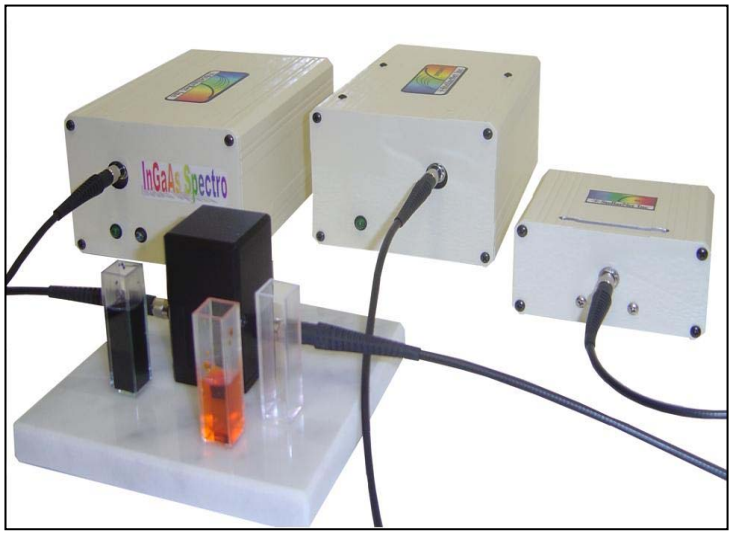
SpectroChemistry Systems

➢ChemWiz Concentration Analyzer

•**Application** panel works with **live spectra** to allow concentration calibration using single wavelength PLS.
•**Load** previously developed PLS chemical calibrations for concentration display of unknown samples.
•**Episodic capture** for kinetics and time series analysis
•Performs single wavelength linear **PLS calibrations.**
•Ideal for in-line **batch** and on-line **process monitoring**



Spectrum of simulated chemical reaction



UV-VIS-NIR system covering 280-1700nm range, with cuvette accessory

➢UV-VIS & Fluorescence

•**Measure deep UV** down to 190nm ultra low stray light **concave gratings** optics that do not use mirrors.

•**Concave gratings** focus a flat field to the detector array providing uniform resolution.

•**LED excitation source** for low cost alternative to laser or bandpass filters.

➢Transmission/Absorbance Studies

•**Dip Probe** – fast, easy sampling of liquids.

- •ATR probes available for dark, viscous liquids

•**Cuvette** – 1cm standard pathlengths

- •Adjustable fixtures available for longer cells

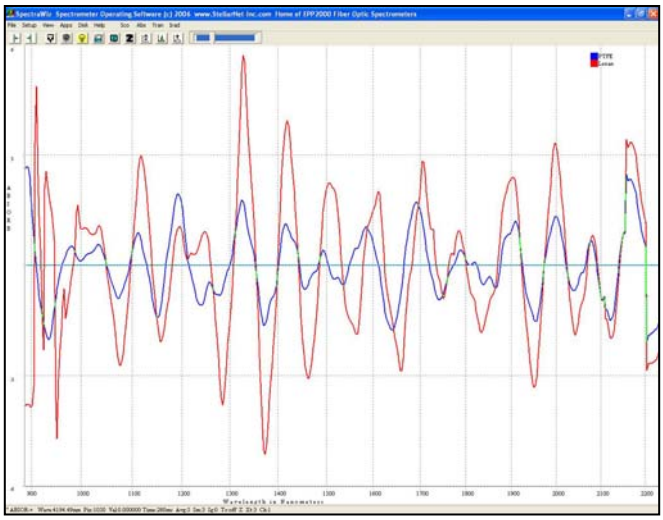
•**Integrated cuvette/light sources**

Dip probes used to measure color, concentration, or kinetics of liquids

SpectroChemistry Systems

➢NIR for Compound Identification

- **Neural Network** software package available for quantitative analysis of unknown samples.
- Measure from **900nm up to 2.3 um.**
- **Combine with UV-VIS** system to cover entire the 200-2200nm range
- Perform color and compound ID analysis in real-time



2nd Derivative data of various plastics, used for identification in recycling plants

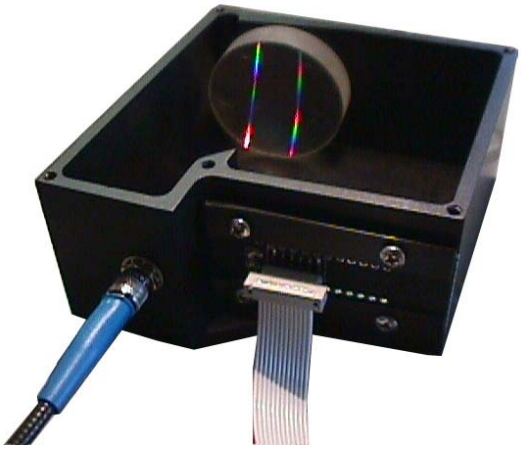
Spectrometers include fiber optic input and USB2 interface to PC plus SpectraWiz software with CD training video

Item	Description	Price
BLACK-*Comet*	**Concave grating UV-VIS spectrometer:** Model **C**=190-850 or **CXR**=280-900nm	$2,750
BLACK-*Comet* Super Range	**Concave grating UV-VIS-NIR spectrometer:** Dual blaze sensitivity has widerange Model **C-SR**=200-1080nm or choose model **CXR-SR** = 220-1100nm.	$3,495
RW-NIR-512	**RED-Wave NIR spectrometer** for 900-1700nm, cooled 512 InGaAs PDA	$13,125
RW-NIR-1024	**RED-Wave NIR spectrometer** for 1000-1700nm, cooled 1024 InGaAs PDA	$17,125
RW-NIRx-512	**RED-Wave NIRx spectrometer** for 900-2300nm, cooled 512 InGaAs PDA	$17,995
	Fiber Optic accessories for	
CUV1	4-way cuvette Holder with 2 lenses – 1 lens position at 90 deg for	$595
TFX-3	Adjustable pathlength Transmission Fixture with 2 LENS-QCOLS	$495
DP400-VISNIR	Dip Probe for Vis-NIR (for UV-Vis-SR add $100)	$1595
	Fiber Optic light sources	
SL1-Filter	SL1 10,000 hour halogen light source with filter holder nose and filter.	$595
SL1-CUV	SL1 10,000 hour halogen light source with integrated cuvette holder	$655
SL1-LED	Miniature fiber optic light source with replaceable LED. Includes set	$695
SL3	Fiber optic deuterium light source with 4,000 hour Hamamatsu L2D2	$1495
SL5	Deuterium + Tungsten UV/Vis/NIR Lamp (for integrated cuvette	$1045

Color Measurement Systems

➢ BLACK-*C*omet CXR SpectroColorimeter

- Reliably measure CIELAB & Delta E* values
- Fiber optic Interface for sampling accessories
- Concave grating provides high sensitivity and
- Consistent resolution throughout 280-900nm range
- No mirrors for lowest possible stray light
- Extremely rugged with no moving parts
- Shock-proof durability and permanent alignment
- Miniature size, low cost, portable instrumentation
- Battery pack options for field measurements
- Simple USB2 interface to notebook & desktop PCs



High performance spectrocolorimeter has internal concave grating spectrograph optics with no mirrors or adjustments

RFX Reflectance fixtures have integrated halogen light source to make color measurement easy by placing samples on top

➢ Color Measurement Accessories

- **Liquid samples** - cuvette holder or dip probe
  - Food & Beverage
  - Industrial & Home liquids
- **Solid samples** - reflectance probe or fixture
  - Textiles
  - Plastics
- **Powder samples** - reflectance fixture
  - Pharmaceuticals
  - Raw materials

➢ Versatility with Fiber Optics

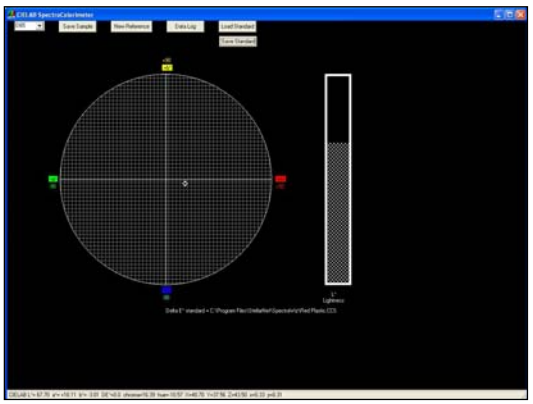
- **For use** in the lab, in the field, on-line, or at-line on the production floor
- **Color monitoring** and measurement
- **Quality Control** of incoming raw materials or finished products
- **Little to no sample prep needed!**

Reflectance Probe & Light source

Color Measurement Systems

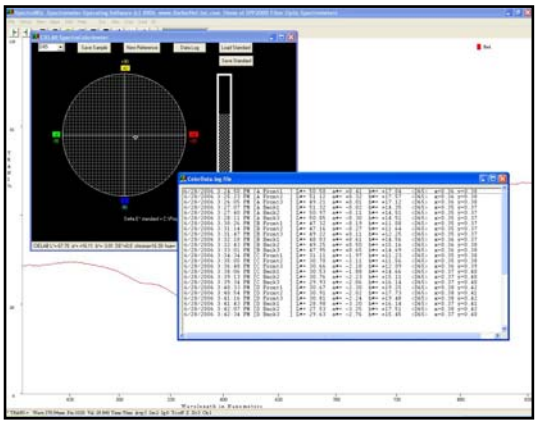
➢ SpectraWiz Software included free

- **CIELAB color app measurements**
    - **L*:** Brightness (0 to 100)
    - **a***: Green (-a) to Red (+a)
    - **b*:** Blue (-b) to Yellow (+b)
    - **Delta E*** color difference
    - **X Y Z** tristimulus
    - **xy** chromaticity
    - **chroma**
    - **hue**



CIELAB color measurement application

- **Select any illuminant (A-C,D50-D75,F1-F12)**
- **Compare samples to saved color standards**
- **Sample color values can be saved to text file**



Color App and Data log work with live Spectra

➢ Measure Delta E* color difference

- Compare sample colors quickly & accurately
- Color variation displayed as numerical value
- Identify variations better than your eyes

➢ **Save your own** color standards for comparison
- Open color standard file for Delta E* value measured against target sample

➢ **Easily save color data** into text log file
- Import log into Word or Excel for data management and QC reporting

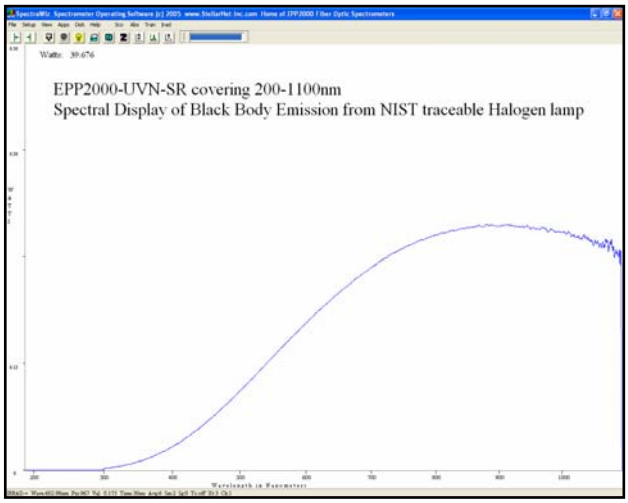
Item	Description SpectroColorimeters include SpectraWiz software free	Price
BLACK-CXR	SpectroColorimeter -best quality concave optics with fiber optic & USB2 interface	$2750
BLUE-Wave-VIS	SpectroColorimeter -compact miniature optics with fiber optic & USB2 interface	$2500
GREEN-Wave-VIS	SpectroColorimeter -lowest cost miniature optics with fiber optic & USB interface	$1948
	Accessories for solids or powders using a reflectance stand – samples placed o top	
RS50	Reflectance standard to set white reference, 50mm diameter	$125
RFX-2	Reflectance fixture with integrated light source & F600-VIS-NIR fiber optic cable	$625
	Accessories for solids or powders using a reflectance probe – samples place under	
RS50	Reflectance standard to set white reference, 50mm diameter	$125
R600-8-VISNIR	Reflectance probe VIS-NIR, 600um fiber optic cable, 7 illuminate around 1 read	$495
RPH	Reflectance probe holder. Maintains 45 or 90 degree angle variable distance (0-3/4")	$125
RTIP45	Black tip has 45 degree angle and slides onto reflectance probe and locks to set position	$125
SL1	Light source to illuminate fiber optic probe with 10,000 hour Tungsten-Krypton bulb	$375
SL1-Filter	Option instead of SL has color equalization filter in 0.5 inch diameter nose cone	$595
	Accessories for liquids – samples placed in cuvette or dip probe placed in beaker	
SL1-CUV	Integrated light source with standard 10 mm cuvette holder and F600 fiber	$655
DP400	Dip probe with 400um armored fiber, includes 10mm path length tip (requires SL1 light)	$1595
DP400-TIP	Additional tips for dip probe. Specify 2, 5, 10, or 20mm path lengths	$410

SpectroRadiometer Systems

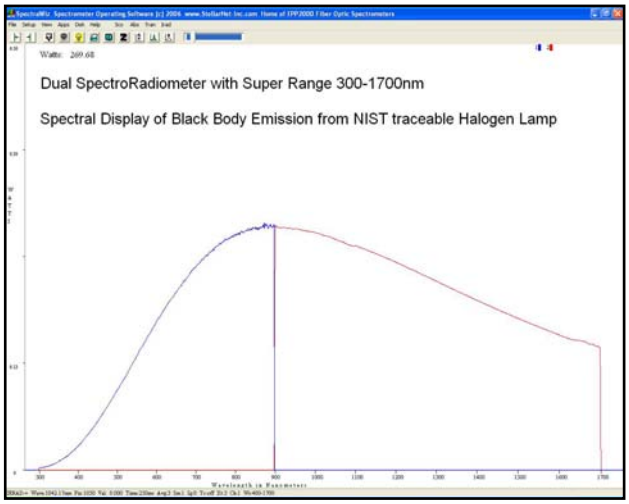
➢ UV-VIS & NIR Wavelengths 200-1700nm

- BLACK-*C*omet Concave Grating 200-850 / 280-900nm
- BLACK-*C*omet "Super Range" 200-1080 / 220-1100nm
- UVN-SR Super Range 200-1100nm CCD range
- Dual-Detector "Super Range" CCD + NIR-InGaAs

➢ Low cost - Ruggedized high performance
➢ Shock-proof - Permanently aligned
➢ Battery packs for field measurements
➢ USB-2 interface for Win32 XP/Vista/Win7



Halogen-lamp spectra - UVN-SR Spectro 200-1100nm



Halogen-lamp spectra – Dual-Detector SR 300-1700nm

➢ NIST Calibration

- **Fast delivery:** most system can be calibrated and shipped within 1 week after receipt of order.
- **Absolute calibration** accuracy within +/- 5% at detector integration setting used for calibration.
- **Certificate available** - documentation with NIST traceable serial numbers.

➢ SMA 905 Fiber Optic Accessories

- **F600 or F1000 Fiber cables and Direct attach**
- **Integrating Light Sphere** – 180° field of view
  - Standard 2" IC2 or LS4" and LS6" and larger spheres available

- **Cosine Receptors** – 180° field of view
  - CR2 for UV-VIS-NIR spectrometers
  - CR2-AP aperture for x10 brighter meas.
  - CR2-Lens reduces field of view to spot, enables spectral radiance calibration to measure watts/(sr m^2 nm) + candela

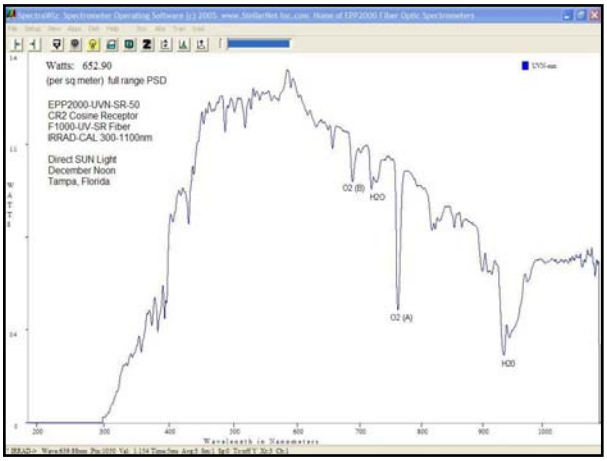
IC2 Integrating sphere with tripod

SpectroRadiometer Systems

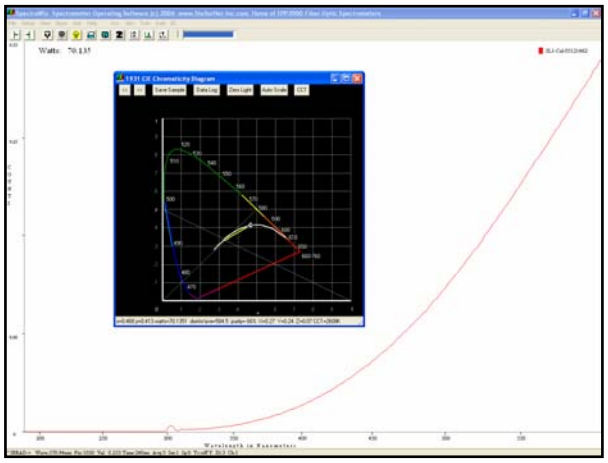
➢ SpectraWiz Software included FREE

- **Absolute intensity measurements**
  - Radiant Flux – watts/nm
  - Luminous Flux –lumens/nm
  - Irradiance --watts/m^2, micro-watts/cm^2
  - lumens/m^2 -- LUX
  - moles per second -- PAR
  - Footcandles /m^2
  - xy Chromaticity, dominant wavelength, purity
  - correlated color temperature CCT and CRI
  - Set Power Spectral Density (PSD) range

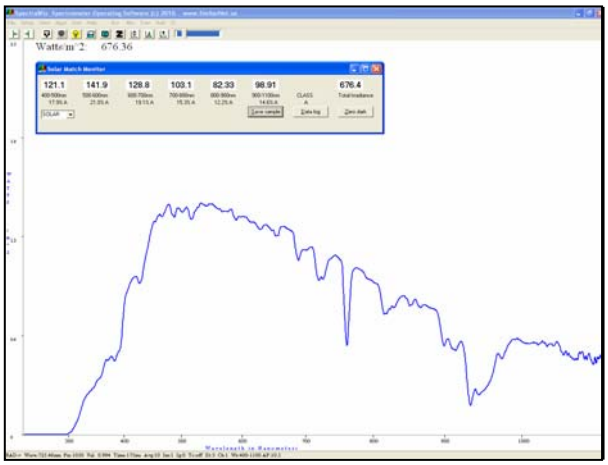
- **Perform SpectroRadiometric calibrations**
- **LED / Laser / Solar / Plasma / ~ Emissions**



Direct SUN Light – December Noon – Tampa, FL



1931 xy chromaticity diagram measures color of light and CCT



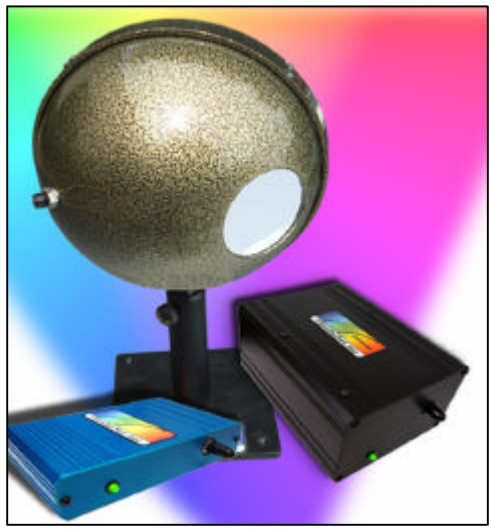
Solar Spectral Match Application Panel- Classify Lamps

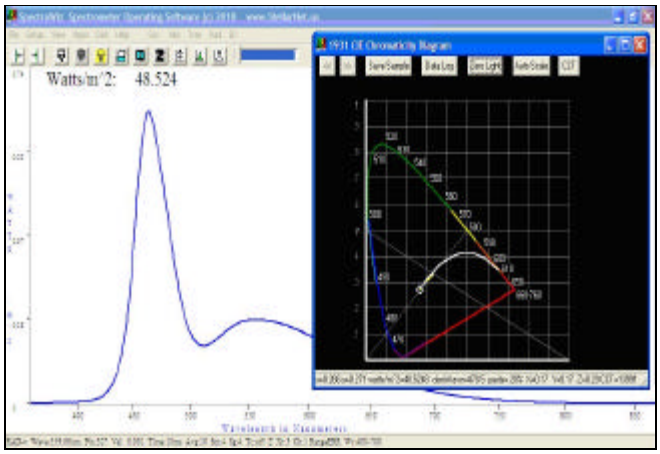
Item	Miniature Fiber Optic SpectroRadiometers	Price
BLACK-Comet	C model for 190-850nm or CXR model for 280-900nm with 2048 pixel CCD detector	$2750
BLACK-Comet-SR	Super Range Dual Blaze grating C=200-1080nm or CXR=220-1100nm w/ 2048 CCD	$3495
BLUE-Wave small	VIS model for 350-1050nm or UV model (+$200 extra) 200-600nm w/ 2048 CCD	$2500
EPP2000-UVN-SR	Super Range UVN model for 200-1100nm with Dual Grating and w/ 2048 pixel CCD	$3495
RED-Wave-512	NIR range for 900-1700nm with 512 pixel InGaAs PDA detector, 5nm FWHM	$13,125
RED-Wave-1024	NIR range for 900-1700nm with 1024 pixel InGaAs PDA detector, 2.5nm FWHM	$17,695
	NIST Traceable Calibrations	
IRRAD-CAL	VIS-NIR for range 300-1700nm Note: actual spectrometer range can be smaller	$250
IRRADUV-CAL	UV for range 200-600nm Note: actual spectrometer range can be larger	$250
IRRADCAL-UVN	UV-VIS for range 200-850nm Concave grating only, dual UV+VIS calibration	$500
RAD-CAL	Radiant power calibration (flux) in Watts/nm and Lumen/nm (for LEDs) 300-1100nm	$250
RAD-CAL-DOC	Optional calibration certificate with equipment details and NIST traceable numbers	$125
	Fiber Optic Accessories for SMA-905 fiber optic attachment	
CR2	CR2 Cosine Receptor for UV-Vis-NIR with 1/4 inch diameter for SMA 905	$125
CR2-AP	Screw on aperture for CR2 allows measurement of light that is 10 times brighter	$125
F600-VIS	Armored 2 meter fiber optic cable attaches Receptor or Sphere to SpectroRadiometer	$140
IC2	Integrating Cube (with sphere inside) 2 x2 x2" with 5/8 inch input port, 2 SMA I/Out	$495
IS6	6" integrating sphere, 2.0" input port, SMA fiber optic output, internal white coating	$1745
IS12	12" integrating sphere that allows for internal mounting of devices for light measurement such as discrete LEDs, arrays, and bulbs. The sphere opens for simple access to mounting devices. IS12 Sphere includes lamp with data file used to calibrate the system for total flux measurements in watts/nm and lumens/nm.	$3495

LED Measurement Systems

➢ NIST Calibrated LED Metrology

- Reliably measure LED output in **Lumens** *(Luminous Flux)*, **Watts** *(Radiant Flux)*, **watts/m^2, microwatts/cm^2, lumens/m^2, moles per second, PAR, Footcandles, mcd, CRI** and the new **CQS**
- Real-time 1931 CIE Chromaticity diagram for **xy chromaticity, Dominant Wavelength, Purity**, and **Correlated Color Temperature (CCT)**
- **NIST Traceable** Irradiance Calibration service. Also, calibration lamps available for customer's calibration using free SpectraWiz software
- Spectrometer configurations available to cover the extended 200-1700nm range



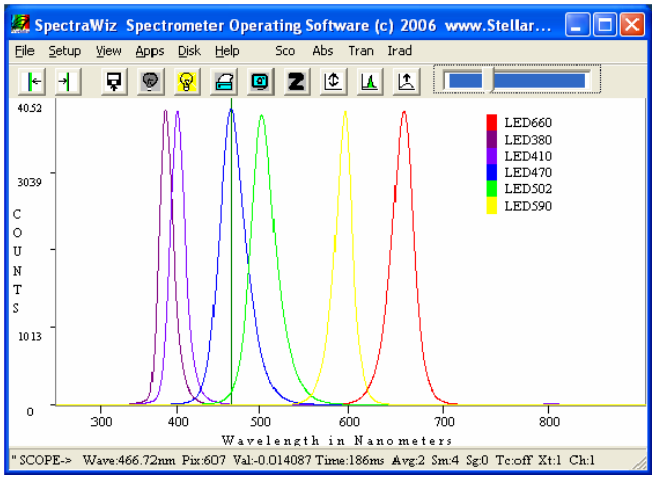


➢ Miniature Spectrometer Systems

- Systems include a miniature spectrometer, a fiber optic cable (or direct attachment), a light collecting accessory, and an irradiance calibration.
- Low cost - Ruggedized high performance
- Shock-proof - Permanently aligned
- Simple USB2 interface to Netbook & PC's
- Most system can be calibrated and shipped within 1 week after receipt of order
- 2"-12" Integrating Sphere Options
- Perfect for lab, process, or field applications

Item	Description	Price
	SpectroRadiometers with SpectraWiz software for LED and light measurements	
BLUE-Wave-VIS	Smallest SpectroRadiometer 16bit, USB2 interface, 50um slit, VIS model for 350-1100nm	$2500
BLACK-Comet	SpectroRadiometer 16bit, USB2 interface, choose model "C"200-850nm or "CXR"280-900nm	$2750
BLACK-Comet-SR	"Super Range" SpectroRadiometer 16bit, USB2, choose "C"200-1080nm or "CXR"220-1100nm	$3495
RED-Wave-NIR	SpectroRadiometer for NIR 900-1700nm, connects with VIS range units for extended coverage	$13,125
	Fiber Optic Accessories	
CR2	¼" Miniature cosine receptor attaches to fiber tip or can be direct attached via SMA-coupler $35	$125
CR2-AP	Aperture mounts on CR2 for 10x brighter LEDs –equivalent to 10%T corrected by SpectraWiz	$125
IC2	2" Miniature Integrating Sphere provides accurate LED xy-chromaticity color measurements	$495
IS6	6" Integrating Sphere with SMA905 fiber optic interface and 2.0" light receptor input port	$1745
IS12	12" Integrating Sphere with SMA905 fiber optic interface, open to insert LED bulb or arrays, includes internal calibration lamp for lumen flux and post fixture for sample mount.	$3495
TP1	Miniature Tripod for Integrating Light Sphere or CR2 cosine receptor	$49
F600	Fiber optic cable sends signal from light receptor to Spectrometer (add $55 for UV-SR fiber)	$140
	NIST-Traceable Irradiance Calibrations (add $125 for traceable calibration document)	
IRRAD-CAL-UV	UV Irradiance calibration for 200-600nm range in Watts/m^2/nm	$250
IRRAD-CAL	VIS or NIR Irradiance calibration for 300-1100nm or 900-1700nm range in Watts/m^2/nm	$250
RAD-CAL	Radiant power calibration (flux) in Watts/nm and Lumen/nm (for LEDs) 300-1100nm	$250
RAD-SRCAL	Radiance calibration in Watts/sr/m^2/nm can measure Cd/m^2/nm - requires CR-LENS for CR2	$250

Low Cost Fluorescence System



LED Emission Spectra can be used for Fluorescence Excitation

- **Excitation Wavelength-** only limited by frequency of installed LED with 100's of different LEDs available.
- LED-UV bulbs available (not included) 295 thru 390nm. Reduced power requirement for UV excitation.
- **Ultimate Flexibility-** can attach monochromater or laser as excitation source to cuvette holder port if needed.

- **SL1-LED excitation source** ideal for Fluorescence measurements. Includes the SL1-LED plus an LED kit consisting of 6 LED's including a white LED. LED's can be swapped without any wiring changes, just pull one out and push the next one in.
- **CUV-F** Fluorescence fixture includes a large base to accommodate the SL1-LED excitation source. Includes 600 micron Y-fiber for dual pick-up for x2 signal gain in fluorescence detection.
- **Increased signal** is achieved by using a Y-fiber for dual pick up of the fluorescence event.
- **Best suited for our Black Comet-TEC** Concave grating spectrometer. The detector has an integrated Thermo Electric Cooler (TEC) maintained at –10 °C from ambient and stabilized within +/-0.1°C.

Excitation Source, Spectrometer, and Accessories

Item	Description	Price
SL1-LED	Miniature fiber optic light source with replaceable LED's. Includes LED-Kit with set of 6 LEDs for 390nm, 470nm, 502nm, 590nm, 660nm, white	$695
CUV-F	Cuvette holder for SL1-LED, includes F600 Y-fiber	$765
BLK-CXR	Concave grating spectrometer without TEC for range 190-850nm or 280-900nm	$2750
BLK-CXR-TEC	Concave grating spectrometer with TEC for >3000ms detector integration times	$4045

Specifications

LED Type	T-5 mm	**Fiber Options**	600 micron Y-fiber
LED's included	390, 470, 502, 590, 660nm	**LED life**	10,000 hours
UV LED's available (prices vary)	295, 345, 365, 385, 390nm	**LED life**	10,000 hours
Spectral range	Depends on LED installed	**Connectors**	2 x SMA 905

www.StellarNet.us

Analytical Instrumentation

Surf the New Wave in Portable Fiber Optic Spectrometry

PORTA-LIBS-2000 Instrument for Laser Induced Breakdown Spectroscopy

The PORTA-LIBS-2000 is the first **truly portable** low cost **elemental analyzer** that can be used for real-time qualitative measurements of **trace elements**. It can be used for dedicated applications in the field or just about anywhere. Portable fiber optic spectrometers configured for high resolution are integrated with a high intensity pulsed laser, and sample chamber, to permit UV-VIS-NIR spectral analysis of unknown samples. The portable instrument case is just 18 x 14 x 7 inches and operates via 12 volt adapter or battery. Detection requirements determine the number of required spectrometer channels. Up to 8 high resolution spectrometers can be attached via USB-2 computer interface with 0.1 or 0.2nm resolution.

Laser **I**nduced **B**reakdown **S**pectroscopy or **LIBS** has become the common acronym for element detection via laser induced plasma. This permits real-time qualitative identification of trace elements in solids, gases, and liquids via optical detection of elemental emission spectra. Using this technique, little or no sample preparation is required and calibration-free quantitative analysis has been reported without matrix effects.

The SpectraWiz software provides element identification via spectral database for qualitative measurements. Samples can be quickly measured and saved to log-file. Options allow customization of spectral search algorithms. Custom compound element libraries can be created or searched.

PORTA-LIBS-2000 can be useful for a variety of applications. Here's just a few:

- Industrial materials analysis
- Prospecting & Mining
- Environmental monitoring
- Homeland security measures
- Military chemical and biological agents
- Forensics analysis
- Pharmaceutical R&D
- Gemology and Counterfeit detection

Specifications		**PORTA-LIBS-2000-LSR1**	**$19,995**
Spectrometer channels:	Expandable to 8	Case Dimensions:	7 x 14 x 18 inches
Spectrometer ranges:	190-1100nm wavelengths	Data transfer speed:	1ms per channel
Optical resolution:	HR=0.1nm or SR=0.2nm	Spectrometer Interface:	USB2 / USB2 hub
Detector type:	2048 pixel CCD array	Laser Power in:	350 mA @ 12 VDC
Laser type:	Pulsed Nd-YAG @1064nm	Laser power out:	2x consecutive 25mJ,4ns pulse
Laser model & rep rate:	Kigre MK-367, 1 Hertz	Power to sample:	6 MegaWatts
Laser lifetime:	> 300,000 shots	Plasma chamber:	2 x 2 x 3 inches
SR wavelength range:	200nm =200-400/400-600	Operating systems:	Win9x/XP/Vista/Win7
HR wavelength range:	100nm =200-300/300-400	Software included:	SpectraWiz Spectral-ID
Additional channel:	SR=$3000 HR=$3500	Customizable software:	LabView,Excel+VBA,Delphi
Example configurations:			
LSR1 $19,995	1 channel, 200nm range	LHR2 $23,995	2 channels, 200nm range
LSR2 $22,995	2 channel, 400nm range	LHR3 $27,495	3 channels, 300nm range
LSR3 $25,995	3 channel, 600nm range	LHR4 $30,995	4 channels, 400nm range
LSR4 $28,995	4 channel, 800nm range	LHR5 $34,495	5 channels, 500nm range
LSR5 $31,995	5 channel, 1000nm range	LHR6 $37,995	6 channels, 600nm range

StellarNet Inc

14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-0394**

www.StellarNet.us
ContactUs@StellarNet.us

PORTA-LIBS-2000 High Resolution Spectrometers for Plasma Emissions

The PORTA-LIBS-2000 spectrometers are miniature fiber optic instruments for UV, VIS, and NIR measurements in 190-1100nm spectral ranges. Each unit contains a high speed integrated digitizer with a 4K word spectral scan memory to provide instantaneous spectral capture from the highly sensitive 2048 element CCD detectors. Various models provide a choice of grating range and slit resolution to fit detection requirements. Fiber optic cables deliver the spectral signal from the sample chamber and use standard SMA 905 connections.

LSR-Series
(0.2nm resolution)

LHR-Series
(0.1nm resolution)

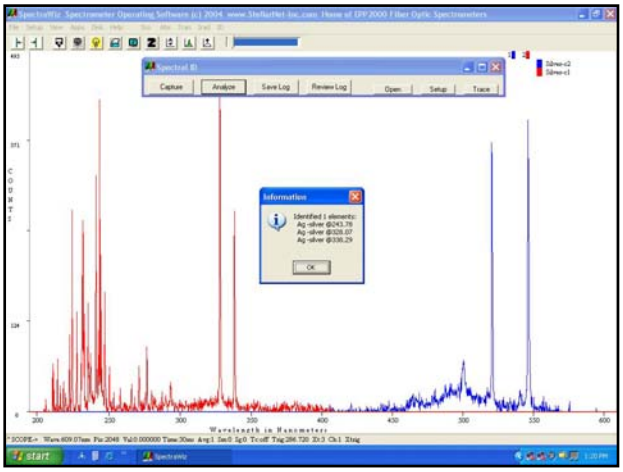
The spectrometer optics are exceptionally robust in a vibration tolerant modular design that has no moving parts. The detachable optics assembly and control electronics are protected inside a rugged metal enclosure, suitable for portable applications.

Several units may be daisy-chained via USB-2 hub allowing for expandable configurations. The LHR high resolution spectrometers have double the resolution (0.1nm) over LSR standard models (0.2nm) with the same grating. The LSR models on the other hand have twice the wavelength range of the LHR allowing for a smaller number of channels when application requirements permit. Most elements have elemental emission spectra in the 200-600nm UV-VIS range, leaving just a few in the 500-925nm VIS-NIR range.

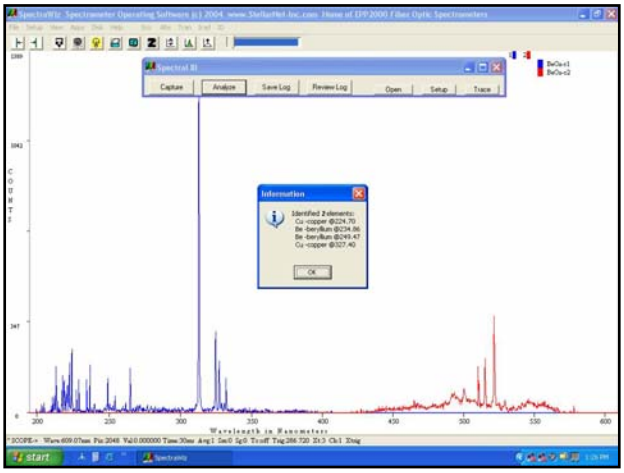
BLUE-Wave LSR Model	**Wavelength Range in nm**	**Grating g/mm**	**Slit-14 nm res.**
UV2	200-400	2400	0.20
VIS4	400-600	2400	0.20
VIS4b	600-800	2400	0.20
NIR3b	800-1000	1800	0.20
EPP2000 LHR model	**Wavelength Range in nm**	**Grating g/mm**	**Slit-7 nm res.**
UV3	200-300	2400	0.10
UV3b	300-400	2400	0.10
VIS3	400-500	2400	0.10
VIS3b	500-600	2400	0.10
VIS3c	600-700	1800	0.10
NIR3	700-800	1800	0.10
NIR2	800-960	1800	0.10
NIR2b	950-1100	1200	0.10

Each PORTA-LIBS spectrometer includes fiber optic cable interface to sample chamber and high speed USB-2 computer interface with proper USB hub as needed. Additional cables are provided for laser synchronization and battery operation.

Spectrometer optics include CCD detector upgrade for UV, order sorting filters, and slit. Optical alignment of each channel allows for 5nm of overlap outside of specified range. SpectraWiz software integrates all optical channels into single spectral graph for elemental analysis and display.



PORTA-LIBS spectral ID of 99.998% Silver



Spectral ID of 1.9% Beryllium + 98.1% Copper

14390 Carlson Circle, Tampa, Florida, 33626 USA **www.StellarNet.us**
Voice: **+1-813-855-8687** Fax: **+1-813-855-0394** **ContactUs@StellarNet.us**

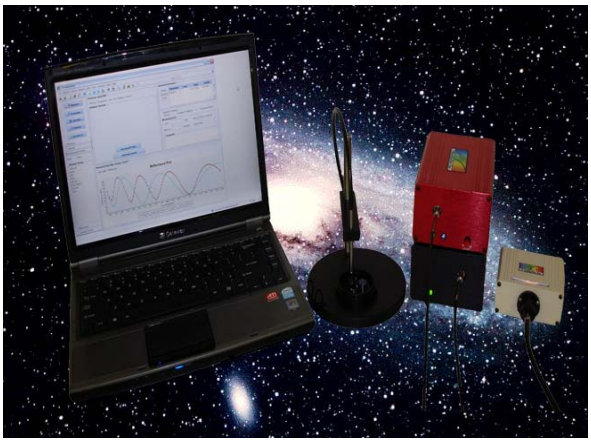
www.StellarNet-Inc.com

Analytical Instrumentation

Surf the New Wave in Portable Fiber Optic Spectrometry

Thin Film Measurement Systems for Single and Multilayer Film Structures

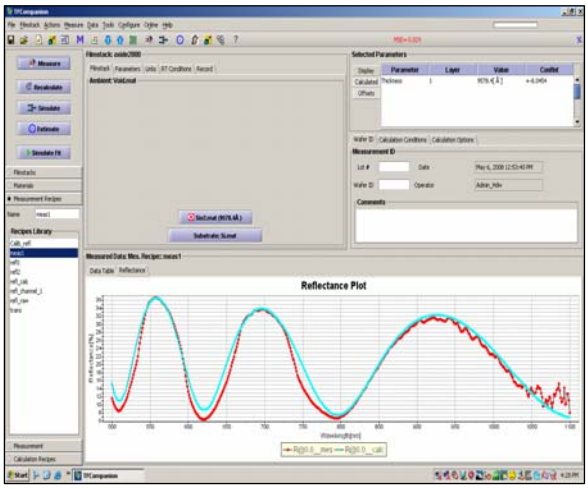
StellarNet's Thin Film measurement systems measure thickness and index of both single-layer and multilayer films in less than a second (up to 5+ layers). The non-contact thickness measurement systems come complete with instrumentation and software including a large library of materials data to support multilayer, freestanding, rough, and both thick & thin layer structures. With USB connectivity and the powerful, user-friendly TFCompanion software, daily complex measurements are made quick and simple! Several configurations are available for measuring thin films with spectral response in UV-VIS, VIS-NIR and NIR wavelength ranges (details on reverse).



StellarNet Thin Film Systems Ideal For:

- ***Solar PV Films*** (TFPVs) including thin silicon, II-VI (primarily CdTe), CIGS, TCO stacks, and polymides.
- On-line thickness measurements of oxides, silicon nitride and many other ***semiconductor process films***.
- In-situ measurement during ***MEMS patterning processes*** used to measure thick photoresist uniformity & thickness.
- ***Hardcoat measurements*** to measure thickness of protective films in the automotive and aviation industries.
- StellarNet Systems are also typical in ***coating measurement applications***.
- Measure LCD & OLED displays, cell gaps
- The thickness of ***rough layers*** on substrates such as steel, aluminum, brass, copper, ceramics and plastics ITO & polyamide structures.

TF-C-UVIS-SRN measures 50A-200um



Anti-reflection coating (SiNx) is represented using Tauc-Lorentz oscillator

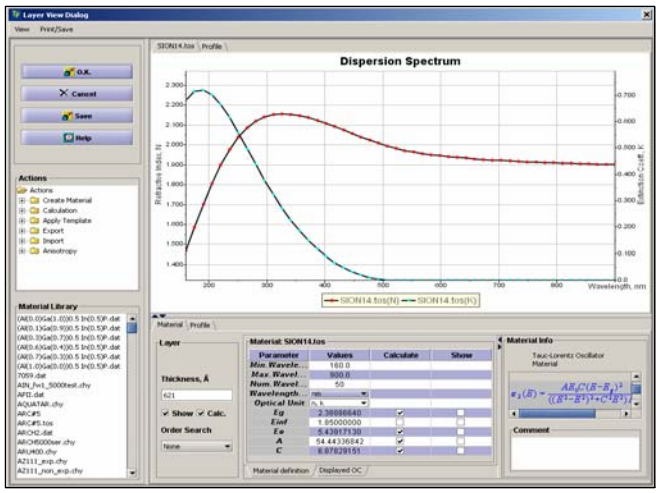
ThinFilmCompanion® Features:

- ✓ **Real-time Spectral Capture and Instrument control for Reflectance and/or Transmittance**
- ✓ **Includes Large Library of Materials Data**
- ✓ **Supports multilayer, freestanding, rough, and both thick and thin layer structures**
- ✓ **New materials can be easily added by measuring corresponding sample or importing data from file**
- ✓ **Supports Parameterized materials : Cauchy, Sellmeir, EMA *(effective-medium approximation),* Harmonic oscillator, Tauc-Lorentz oscillator, Drude-Lorentz**

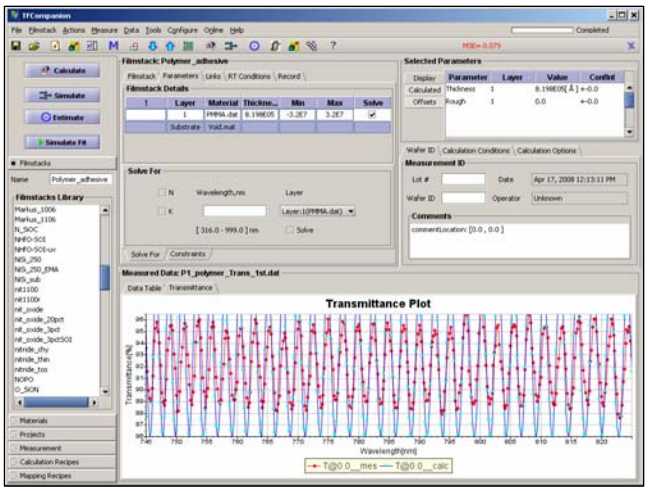
StellarNet Inc

14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-0394**

www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com



Measured optical dispersion (n,k) of SiNx (ARC layer) represented using Tauc-Lorentz approximation.



Transmittance of a free standing polymer. Estimated thickness is ~ 81.9um

The operating software includes a large library of refractive index (n) and extinction coefficient (k) values for the most common metallic, dielectric, amorphous and crystalline substrate materials. Analyze simple and most complex filmstacks - graded layers, periodic structures, very thick films, films on thin substrates, multi-sample measurements, etc.

Measurements are made using reflectance/transmittance spectroscopy which measures the optical response of the layer structure. The user creates an optical model of the layer structure and uses data analysis to determine physical properties and the results are inferred from the best fit of measured & modeled data.

Simulation and error-estimator tools allow user better understand data and the expected precision. During in-situ, in-line or other long running measurements, conditions including surface roughness, ambient light, etc. may be changing. TFCompanion supports roughness and scaling correction that allows factoring in these effects.

TFCompanion also supports Parameterized materials e.g. Cauchy, Sellmeir, EMA (effective-medium approximation), Harmonic oscillator, Tauc-Lorentz oscillator, Drude-Lorentz and many more approximations. These approximations represent optical dispersion of materials in desired spectral range using few coefficients that can be adjusted. For example, oxides are frequently represented using New materials can be added easily by measuring corresponding sample or importing data from the text file.

MODBUS TCP Server Add-on $1500

The Modbus server plugin provides a communication interface over TCP IP. TFCompanion is deployed as a server and supports external program integration. This allows user to send a measurement request from any program and receive back the thickness results data.

StellarNet Thin Film Systems spot size: 1-4mm, Precision (1σ): 1A, >1000nm 2A

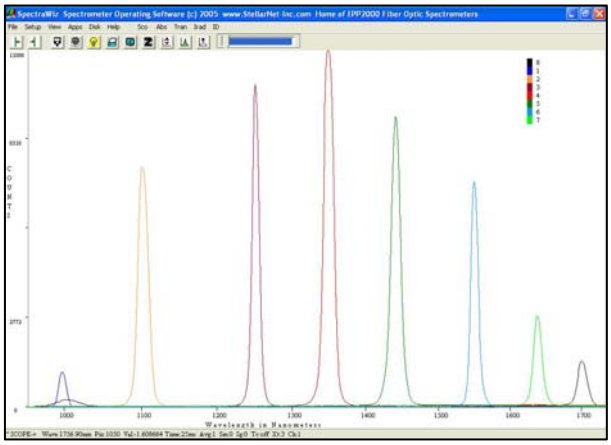
System	Range	Resolution	Thickness	Lamp type	Price
TF-VIS	400-1000nm	<2nm	150A-20um	Halogen **SL1**	**$ 9,950**
TF-C-UVIS	190-850nm	<2nm	50A-20um	Deuterium **SL3**	**$11,320**
TF-C-UVIS-SR	220-1100nm	<2.5nm	50A-20um	**SL1-F+ SL3**	**$12,915**
TF-NIR	900-1700nm	<5nm	1000A-200um	Halogen **SL1**	**$20,575**
TF-VIS-NIR	400-1700nm	<2nm, 5>1000	150A-200um	Halogen **SL1**	**$23,075**
TF-C-UVIS-SRN	200-1700nm	<2nm, 5>1000	50A-200um	Hal+Deut **SL4**	**$25,900**

14390 Carlson Circle, Tampa, Florida, 33626 USA **www.StellarNet-Inc.com**
Voice: **+1-813-855-8687** Fax: **+1-813-855-0394** **ContactUs@StellarNet-Inc.com**

Optical Measurement Systems for Filters, Films, and Coatings

Spectrometer systems and options:

- Reliably measure a variety of optics samples (glass, plastics, etc) with thicknesses from a few mm to a few inches.
- Characterize tint/color (with CIELab values), transmission profiles, and UV cutoff for research and QA/QC applications.
- High Resolution UV-VIS (< 1nm) and NIR (< 2nm) spectrometers available for small gap Bandpass filters.
- Connect multiple spectrometers together with our DUAL-DSR options to cover the extended 200-2300nm range.



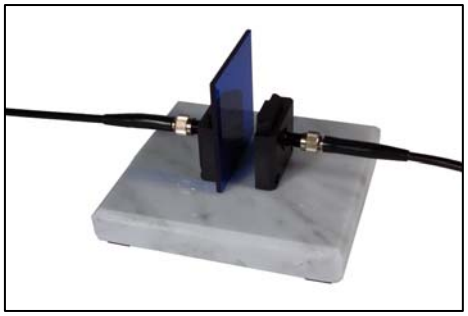
NIR transmission spectra of various optical filters

Available Accessories:

- **TFX1:** Fixed 10mm pathlength.
- **TFX3:** Adjustable pathlength from a few millimeters up to a few inches for horizontal samples.
- **TXF4:** Adjustable pathlength from a few millimeters up to a few inches for vertical samples.

TFX4 variable transmission fixture

TFX3 variable transmission fixture



TFX1 fixed pathlength transmission fixture

Item	Description	Price
	UV-VIS-NIR Spectrometers	
BLK-C	UV-VIS concave spectrometer for 190-850nm, USB2 interface, & SpectraWiz software	$2,750
BLKC-SR	“Super Range” concave spectrometer for 200-1080nm, USB2 interface, & SpectraWiz software	$3,495
RW-IG-512	NIR Spectrometer for 900-1700nm, connects to VIS range units for extended coverage	$13,125
DSR-CSR-512X	Concave grating (UV-VIS, CCD) plus NIRX-512 (InGaAs PDA) for 200-2300nm	$21,490
	Fiber Optic Accessories	
TFX1	10mm fixed pathlength filter holder; includes two collimating lenses with SMA connections	$450
TFX3	Variable pathlength (horizontal or vert), includes two collimating lenses with SMA connections	$495
TFX4	Variable pathlength (vertical) holder; includes two collimating lenses with SMA connections	$495
F600	Armored fiber optic cables for VIS-NIR, 2 meter length (add $50 for UV-SR grade fiber)	$140
	Light Sources	
SL1-Filter	VIS lamp for 400-2300nm range; 200W optical output	$595
SL3	Deep UV lamp for 200-400nm range; 15W optical output	$1,495
SL5	UV+VIS combination lamp for 200-1700nm range; 1W optical output	$,1050

ChemWiz® Analyzer Development Kit

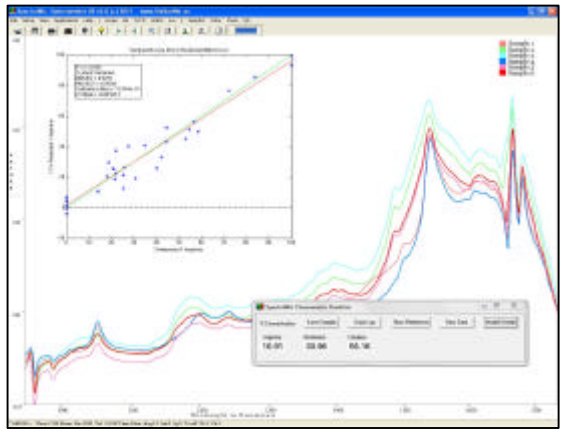
Full spectrum **chemometric analysis** for multiple components can now be performed using the ChemWiz® Analyzer Development Kit (ADK). This software toolkit, when combined with StellarNet spectrometer instrumentation and SpectraWiz operating software, enables rapid development of complex analyzers needed to provide custom measurement solutions for many applications.

Real-time spectral data is used as input to measure concentrations of up to 6 components such as moisture, fat, protein, alcohols, acids, or chemicals such as pesticides. Alternatively, the ChemWiz® ADK can be used to identify samples, such as the types of plastic.

The toolkit includes a model builder which is used to process spectra from a set of known component concentrations. Here the spectral preprocessing techniques are selected such as multivariate scatter correction (MSC), smoothing, derivatives, and mean centering. The multivariate analysis type is then selected such as partial least squares (PLS). Finally a cross validation technique is chosen and used to improve the reported statistics indicating accuracy and *fitness* of the calibration model created.

The ADK includes a runtime engine that performs the analysis in real-time with little to no sample preparation. The measurement results are displayed on the SpectraWiz Application panel for "Chemometric Predictor" which is also provided in our LabVIEW software program for OEM developers.

Each Analyzer system would need to be configured with appropriate sampling accessories and references, for measuring liquids or solids or powders. Solid reflectance works well using the RED-Wave NIR spectrometer (see the DWARF-Star model, cooled InGaAs diode array). For liquid analyzers, sample absorbance is measured in flow cells or dip probes via UV-VIS BLACK-Comet or BLUE-Wave UV spectrometers. Now there's no need to hire a spectral "Chemistry Wizard", just use ours!



Real-time spectral display of sample measurements include concentration values of multiple components.

- **Multivariate algorithms for Quantitative analysis**
  Partial Least Squares PLS, Principle Component Regression PCR
- **Discriminant methods for Qualitative analysis**
  Principle Component Analysis PCA, and MDR
- **Preprocessing options to stablize data**
  Sample averaging, Spectral smoothing,
  First or second derivative with gap select,
  Multiplicative scatter correction, Mean centering,
  and lots more preprocessing options.
- **Visual graphs and Model cross validation**
- **Applications** include:
  Food Safety
  Packaging / Process
  Beverage QC
  Agriculture Feed
  Pharmaceutical
  Oil & Chemical
  Plastics

ChemWiz® Analyzer Development Kit

Item	Description	Price
ChemWiz-ADK	Chemometric model builder plus Wizard runtime predictor engine	$3500 *
Wizard-runtime	Predictor engine for chemometric models – one license only	$1500 *

* Contact StellarNet application scientist as price will vary with choice of 3rd party vendor for model and predictor engine

Specifications

Operating System	WinXP, Vista, Win 7	**Runtime speed**	3Hz max
Runtime	SpectraWiz v5.0 or higher	**Full Spectrum Measures**	Concentrations or Classification
Spectral range	190 – 2500nm	**Analysis (typical)**	PLS or PCA/MDR

ChemWiz® Analyzer Development Kit

Prepared
Standard Samples

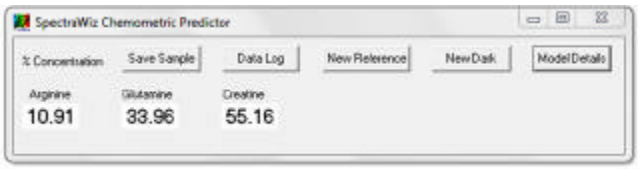
Unknown Samples

StellarNet Spectrometer
Instrumentation

Light Sources & Accessories for liquid, solid, and powder samples

ChemWiz® ADK
Chemometric Model Builder

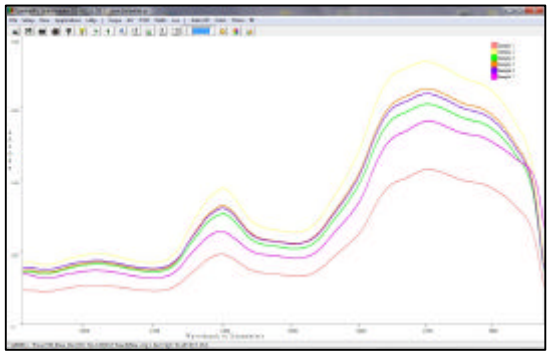
Collect Spectral Data
Preprocess Data
Build Models
Validate Models



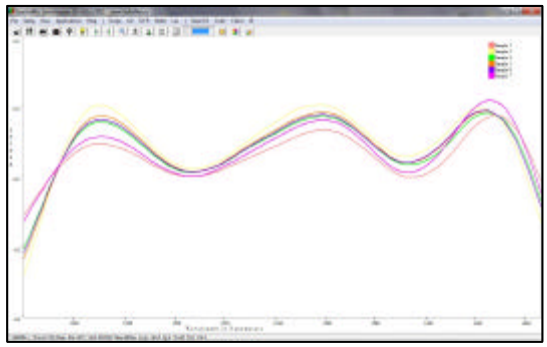
The panel shown is the SpectraWiz software Application for chemometric model predicton, that uses reflectance to measure percent composition of Amino Acid in sample powders. Application is only enabled when the Wizard detects a modeland the runtime chemometric prediction engine is installed.

ChemWiz® ADK
Chemometric Predictor Engine

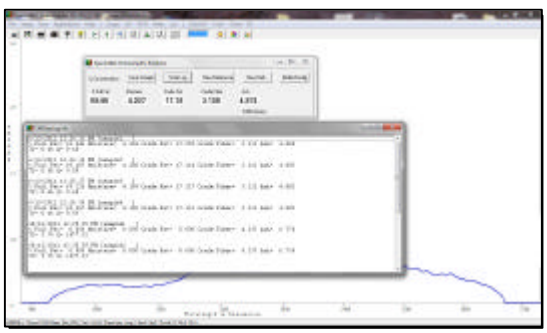
SpectraWiz Software Application
Loads Chemometric model
Acquires Sample Spectrum
Applies Model and Displays Results



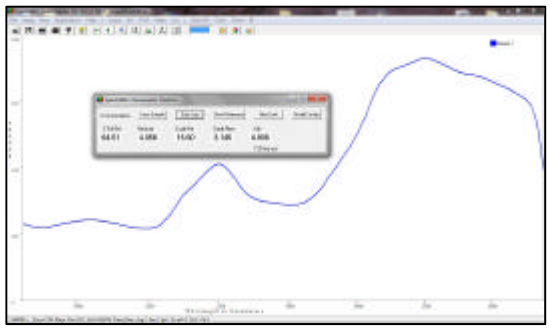
Step 1 - import spectra dataset taken from calibrated samples and select usable wavelength range



Step 2 – Select reprocessing needed for sample type such as scatter correction, smoothing, 2nd derivative



Step 3 - build model and perform cross validation until statistics indicate excellent prediction performance

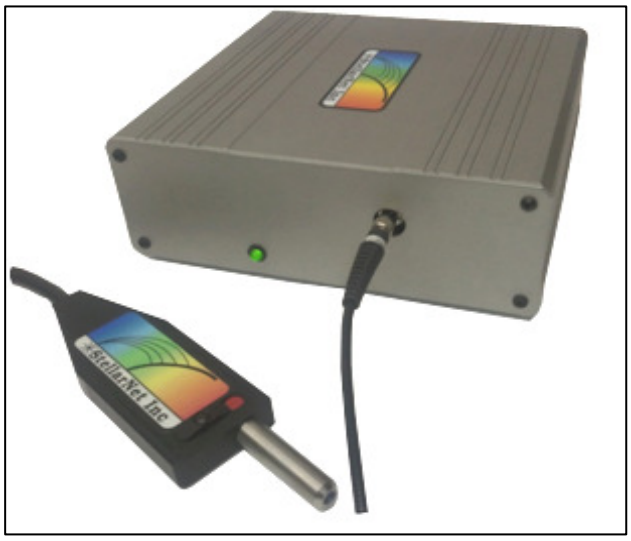


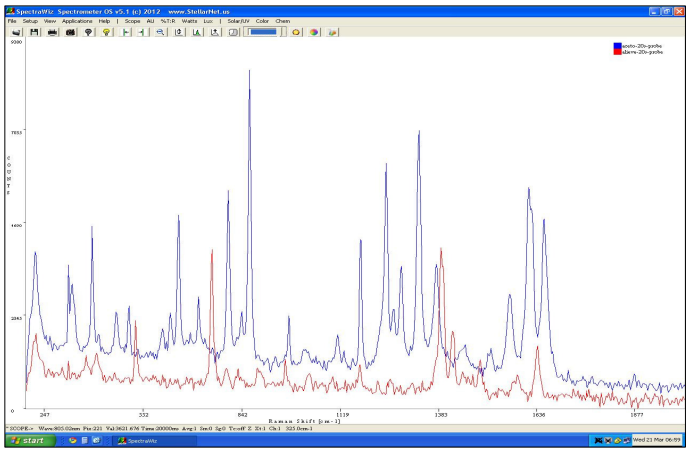
Step 4 – install model on real-time system with prediction engine and StellarNet spectrometer used to collect data

Raman Spectrometers

➢ Raman Spectroscopy Instrumentation

- Our Raman spectrometers are ruggedized miniature spectrometers configured specifically for Raman spectroscopy applications using 785nm lasers
- Enhanced optics allow for extreme sensitivity and extra low stray light values down to 0.05%
- High Resolution models available down to 4 cm^{-1} with options for maintaining S/N with TEC cooling
- Compact size & seriously Rugged for portable and field applications. Metal enclosures are extremely durable!





Raman-HR spectra of Aleve and Acetaminophen

➢ Raman Spectrometer Features

- Low cost - Ruggedized - High performance
- Shock proof - Permanently aligned optics
- Standard Fiber interface to Raman probes
- SpectraWiz Software and SDK included Free
- Simple USB2 interface to Netbook & PC's
- Suitable for lab, process, or field applications

Spec	Raman configured spectrometers		
Optical Resolution:	4 cm^{-1} or 8 cm^{-1}	Dimensions:	1x3x5 inch
Signal to Noise:	1000:1	Weight:	14 ounces
Detector Type:	Enhanced CCD with 2048 pixels	Power Consumption:	<100mA , USB powered
Diffraction Gratings:	1200 g/mm with gold surface	Fiber Optic Input:	SMA905
Spectral Range @785nm	200-2200 cm^{-1} -or- 200-3200 cm^{-1}	Interface:	USB-2
Stray Light:	<0.05%	Operating Systems:	WinXP, Vista, Win7 (32/64-bit)
Exposure Times:	to 20sec -or- to 60 sec w/ TEC	Software:	SpectraWiz, LabView,

Item	Description	Price
Raman-SR	Raman Standard Resolution for 200-3200 cm^{-1} @ 785nm with 8 cm^{-1} resolution via CCD	$3500
Raman-HR	Raman High Resolution for 200-2200 cm^{-1} @ 785nm with 4 cm^{-1} resolution via CCD	$4000
Raman-HR-TEC	Raman High Resolution for 200-2200 cm^{-1} @ 785nm with 4 cm^{-1} resolution via CCD with Thermo Electric Cooler (TEC) for best S/N with detector integration times > 10 seconds	$5295
Raman-SR-TEC-IG	Standard Res for 200-3500 cm^{-1} @ 1064nm with 16 cm^{-1} resolution 512 pix IG PDA + TEC	$13333
Raman-HR-TEC-IG	High Res for 200-3500 cm^{-1} @ 1064nm with 8 cm^{-1} resolution via PDA with TEC cooled 1024 pixel InGaAs photodiode array. Minimize fluorescence via1064nm laser!	$17777

All data and statements contained herein are subject to change in accordance with StellarNet's policy of continual product improvement.
Please contact us about availability of additional laser frequencies used for Raman such as 532 / 647 / 830 / 1064nm.

Raman Spectroscopy Accessories

➢ Ramulaser Portable Laser Accessory

- 785nm Laser attaches to our Raman probe via standard FC/APC connector
- Battery powered in Ruggedized metal case
- Raman Laser line 0.2nm FWHM over 50-100 deg F
- 350 / 499mWatt adjustable power

RamuLaser accessory attaches to Raman probe

RamuLaser for Vials

- 785nm Laser configured with ½" vial holder in place of FC/APC connector (not shown)
- Screw top vials handle both liquid and powder and small solids such as pills
- Small size integrating sphere 2x4x6 inch with 2x2x2 inch with SMA 905 fiber connector output to spectrometer
- Raman Laser line 0.2nm FWHM with 350 / 499mWatt adjustable power

➢ Raman Probe

- Connects to 785nm Laser accessory via FC/APC fiber optic connector and spectrometer via SMA 905
- Rigid probe length is 100mm with integrated Raman filters for 200 cm-1 and f/2 collection optics
- Excitation fiber is 100um and read fiber is 600um designed for signal enhancement in StellarNet spectros
- Probe diameter is 4mm with 2 meter fiber length and has laser blocking switch for simple reference
- Integrated filters for laser line (with O.D. > 6) and notch filter to remove quartz spectral contributions
- Working distance to sample is 4.5mm with field depth of +/- 1mm for penetration of sample containers Includes probe holder for solids like pills or vials (½ inch diameter with lids) for liquids and powders

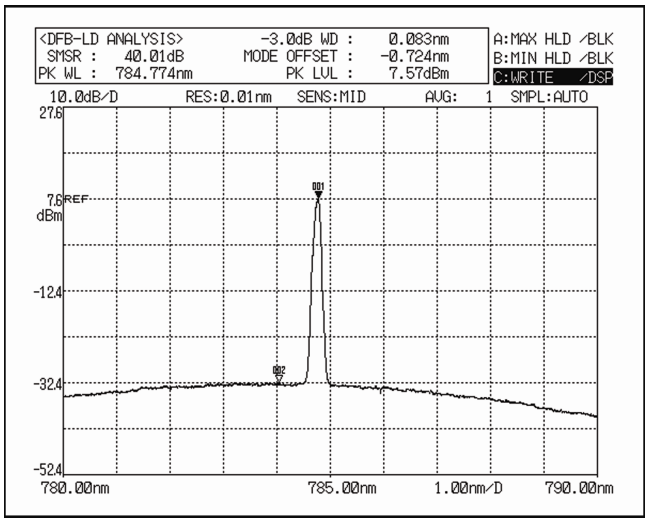
Item	Descriptions for Raman Spectroscopy Accessories	Price
RamuLaser	Portable Raman Laser for 785nm with 350/499mW adjustable output and FC/APC attachment for standard Raman probe (see below). Includes integrated LI battery with charger for 8 hour operation.	$3395
RamuLaser- Vial	Portable Raman Laser for 785nm with 350/499mW adjustable output and integrated vial holder with integrating sphere collected optics. Includes integrated LI battery with charger for 8 hour operation.	$3895
Raman- Probe-785	Attaches to RamuLaser via FC/APC and spectrometer via SMA 905, has integrated Raman filters and optics with working distance of 4.5mm to sample, configured for 785nm laser	$2995

All data and statements contained herein are subject to change in accordance with StellarNet's policy of continual product improvement.
Please contact us about availability of additional laser frequencies used for Raman such as 532 / 647 / 830 / 1064nm.

Spectrum Stabilized Raman Laser Subsystems

➢ Laser Subsystem Features

- >350 mW Fiber Coupled Output Power
- Spectral Linewidth < 0.15 nm
- Ultra-narrow Spectral Linewidth option 1 cm^{-1}
- Temperature Stabilized Spectrum (< 0.007 $nm/^0C$)
- Low Power consumption (< 5.5 W)
- 40 dB SMSR Typical
- 3" x 2.5" x 0.69" Package Weighing < 4 oz



Typical Spectral Plot

Laser features high output power with narrow spectral bandwidth. The laser's stabilized peak wavelength remains "locked" regardless of case temperature (-10 to +55 deg. C). Devices can be spectrally tailored to suit application needs and offer side mode suppression ratios (SMSRs) better than 40 dB, thereby providing extremely high signal to noise ratio and making these sources ideal for Raman spectroscopy and pump laser applications. The laser is integrated with high performance laser drive and temperature control electronics in a compact package weighing less than 4 oz.

Parameter	Unit	Min	Typ	Max	Notes
Optical output power	mw	350	375		
Output power stability	%		± 1		
Peak wavelength	nm	784.5	785	785.5	
3 dB bandwidth (FWHM)	nm		0.1	0.15	
Peak wavelength drift	nm			± 0.10	over life
Optical signal-to-noise ratio (SMSR)	dB	35	45		
Warm-up time	sec			10 / 1.5	cold/warm start

Item	Description	Price
	Miniature Laser Subsystems for Raman Spectroscopy	
SSR-Laser-785-350	Spectrum Stabilized Laser Subsystem @ 785nm with <4 cm^{-1} resolution, 350mw	$4200
SSR-Laser-785-500	Spectrum Stabilized Laser Subsystem @ 785nm with <4 cm^{-1} resolution, 500mw	$4800

All data and statements contained herein are subject to change in accordance with StellarNet's policy of continual product improvement.
Please contact us about availability of additional laser frequencies used for Raman such as 532 / 647 / 830 / 1064nm.

Laboratory Laser Source for Raman Spectroscopy

Designed for use in the laboratory, the user configurable **Lab-LS** laser system provides a turn-key solution with integral laser drive and TEC control electronics, and offers the user the ability to adjust the laser drive current from either the front panel or remotely.

The module has a digital readout for easy set point adjustment, an independent master power key switch and laser enable switch, a remote interlock, and an Emergency Power Off (EMO) pushbutton.

The **Lab-LS** can be ordered with SMA905 or FC/PC or FC/APC bulkhead for easy patch cord attachment. The unit comes complete with an integral AC/DC power supply.

User interchangeable Lab-LS laser modules can be ordered with a variety of standard Raman wavelengths with either single mode (Polarization Maintaining) or multi-mode fiber coupled output.

The **Lab-LS** is a controller mainframe that lets you change in and out laser subsystem modules at will. This fully turn-key unit is **UL/CE & IEC approved**. The **Lab-LS** system provides the ability to adjust laser output power by turning a dial on the front panel and reading out the LED readout.

The small size and AC/DC operating power allows for great portability and use around the Lab or in the Field! The ultimate benefit is having a laser source that can be quickly switched to handle a different Raman wavelength for excitation. A specific sample type may have too much fluorescence at 785nm, however swapping to a 1064nm laser subsystem solves this problem.

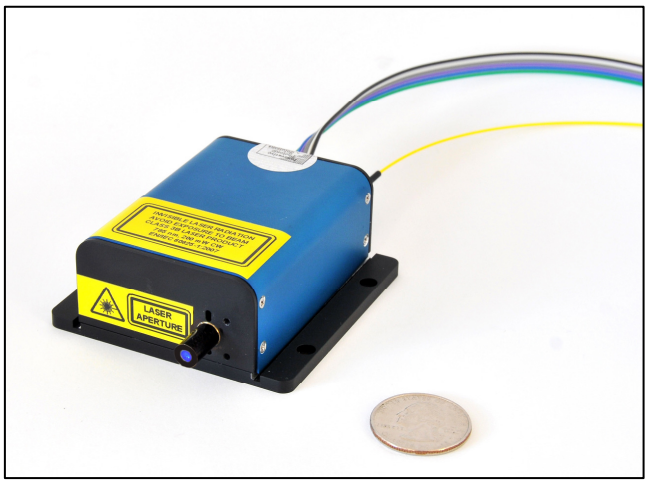
Item	Description	Price
Lab-LS-785	Laboratory Laser Source mainframe with one SSR-Laser-785-350	$6800
SSR-Laser-785-350	Additional Laser Subsystem @ 785nm with <4 cm^{-1} resolution, 350mw	$4200
SSR-Laser-785-500	Additional Laser Subsystem @ 785nm with <4 cm^{-1} resolution, 500mw	$4800

All data and statements contained herein are subject to change in accordance with StellarNet's policy of continual product improvement.
Please contact us about availability of additional laser frequencies used for Raman such as 532 / 647 / 830 / 1064nm.

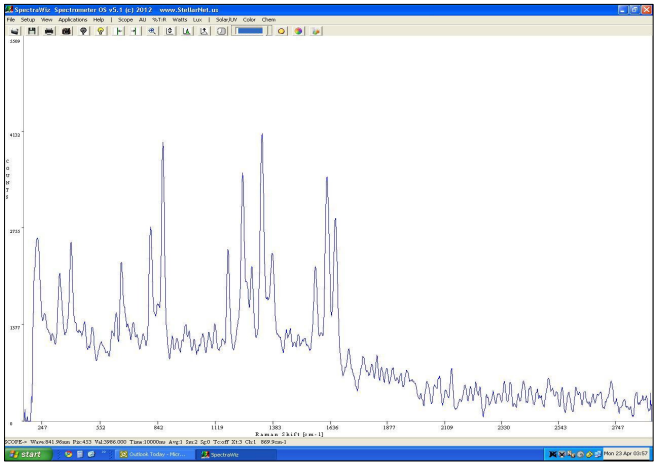
Raman Spectroscopy Accessories

➢ Portable Raman Laser-probe

- 785nm laser-probe with integrated optics
- 100mWatt laser operates on 5VDC
- Raman laser line 0.2nm FWHM
- Ruggedized case with battery power option
- FC to SMA905 fiber to spectrometer included
- 4.2mm focal distance from probe tip
- Ideal for microscope mount or small solid samples such as pills and SERS samples



Portable Raman Laser-Probe for Microscopes and OEM applications



INVISIBLE LASER RADIATION
AVOID EXPOSURE TO BEAM
CLASS 3B LASER PRODUCT
785 nm, 200 mW CW
EN/IEC 60825-1:2007

This laser module is designed for use as a component or replacement part and is thereby exempt from 21 CFR1040.10 and 1040.11 provisions.

← StellarNet Raman-HR spectra of acetaminophen (Tylenol)

Parameter	Unit	Min	Typ	Max	Notes
Laser Optical output power	mW	100	110		Circularized & collimated output beam w ith <0.7 mm dia (1.5:1 aspect ratio) and <2.5 mrad divergence
Output power stability	%		± 0.5	± 1	
Peak wavelength	nm	784.8	785	785.2	
3 dB bandwidth (FWHM)	nm		<1 MHz	0.02	
Operating Temperature Range (Case)	Deg C	10		40	Case Temperature
Polarization Extinction Ratio	dB	17	20		
Power Consumption	W		2	5	C
Wavelength Stability	Seconds			180	Cold Start - to < 1 w avenumber
				1	Warm Start - to < 1 w avenumber
				3	Warm Start - to < 0.1 w avenumber
Absolute Maximum Ratings					
Laser Module Operational Current	A			1	
Laser Module Operational Voltage	V	4.9	5	5.1	Compliance

Item	Description	Price
	Raman Accessories for miniature fiber optic spectrometers	
Raman-LaProbe	Portable Raman laser-probe for 785nm, 100mW output power, 0.2nm FWHM laser with integrated collection optics that includes FC-SMA905 fiber optic cable.	$3995

All data and statements contained herein are subject to change in accordance with StellarNet's policy of continual product improvement.
Please contact us about availability of additional laser frequencies used for Raman such as 532 / 647 / 830 / 1064nm.

www.StellarNet-Inc.com

Analytical Instrumentation

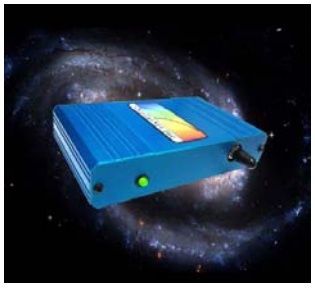
Surf the New Wave in Portable Fiber Optic Spectrometry

StellarNet Miniature Spectrometers are fiber optic instruments designed for laboratory, field, and industrial applications requiring spectroscopy measurements in the 190-2300nm wavelength ranges. The instruments are designed to be vibration tolerant with **no moving parts or** detector sockets for **portable test measurements** and industrial reliability. StellarNet includes SpectraWiz software **Free** with customizable LabView and Excel+VBA programs !

BLACK-Comet Spectrometers for UV-VIS (and NIR w/Super Range –SR)

- **Aberration Corrected** Concave gratings **Deliver** near Perfect Spectral Images
- Concave optics have **No Mirrors** to provide the Lowest Possible **Stray Light**
- Flat field produces **Uniform Resolution** (<1nm) over wavelength range
- 50% **Higher UV** sensitivity below 400nm compared to plane grating optics
- **Ruggedized 16bit Instrument** in Miniature Metal Enclosure (2.7 x4.3 x6 inch)
- Robust instrument is shock proof with no internal optical adjustments
- **4 models**: **C** 190-850nm, **CXR** 280-900nm, **C-SR** 200-1080nm, **CXR-SR** 220-1100nm

→ **$2750** → **$3495 SR**



BLUE-Wave Miniature Fiber Optic Spectrometers for UV-VIS-NIR & OEM

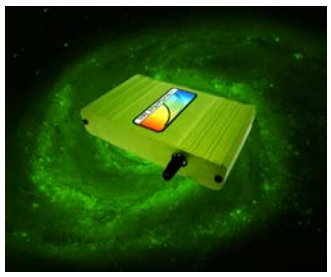
- Wide selection of models for measurements in **190-1150nm wavelength range**
- **UVN eXtreme Grating** technology delivers high efficiency in both UVand NIR
- **16-bit** digitizer with onboard spectral memory and **high speed USB-2** interface
- Up to 8 instruments **connect and operate simultaneously** via USB hub
- External **TTL trigger** for synchronized capture for plasma monitoring and LIBS
- Robust system is shock proof in Miniature Rugged Metal Enclosure

→ **$2500** Detector upgrades for UV range or DLENS cost extra

RED-Wave NIR-InGaAs Spectrometers for 0.9-1.7um & 0.9-2.3um ranges

- **TE cooled** 512 Element InGaAs Photo Diode Array with 25x500um pixels
- Detector delivers **4000:1 Signal/Noise** using Correlated Double Sampling
- **Zero Defect** 512 Detector Array provides 5nm Resolution with 25um slit
- Optional **1024 Detector** for 2.5nm Resolution with 25um slit - **only $4570** extra
- **16bit digitizer** with x10 detector gain switch and **high speed USB-2** Interface
- Robust operation in Miniature **Rugged Metal Enclosure** (2.7 x4.3 x6 inch)

→**$13,125** NIR-512 (0.9-1.7um) →**$17,**995 NIRX-SR-512 (0.9-2.3um)



GREEN-Wave Miniature Low Cost Fiber Optic Spectrometers for UV-VIS-NIR

- Wide selection of models for measurements in **190-1150nm wavelength range**
- **UVN eXtreme Grating** technology delivers high efficiency in both UV and NIR
- **12-bit** digitizer with onboard spectral memory and **USB-1** interface
- Single unit operations with optical resolutions down to 0.3nm FWHM
- Robust system is **shock proof** in Miniature **Rugged Metal Enclosure**
- **Ideal for low cost** applications like educational labs and field spectroradiometers

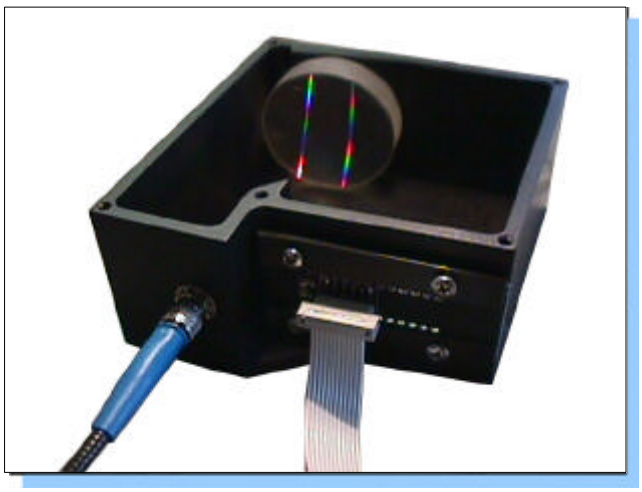
→ **$1948** Detector upgrade for UV range <350nm cost extra

StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

BLACK-Comet Concave Grating Spectrometers for UV-VIS & NIR

The BLACK-Comet spectrometer series offers low cost, research grade performance in a small, ruggedized package. The instruments are exceptionally robust with no moving parts and are packaged in a small metal enclosure for a variety of spectroscopy applications in field, research lab, factory process, and QA/QC environments.

Each spectrometer utilizes a 40mm diameter concave grating with aberration correction to provide superb spectral imaging. This significantly improves spectral shapes by reducing comma and astigmatism present in



plane grating miniature spectrometer designs. The flat field spectrograph architecture does not utilize mirrors and therefore provides the lowest possible stray light in the UV. StellarNet's patented optical design with permanent alignment employs no grating adjustments to provide unbeatable thermal stability minimizing wavelength drift from temperature. A multi-band filter is integrated into the spectrograph to provide order sorting and prevent optical aliasing. The instruments optical input is a standard SMA-905 connector, using single strand fiber optic cable with typical silica core diameters of 400um, 600um, and 1000um. Each spectrometer connects via the supplied USB2 cable and requires no external power supply. ThermoElectric Cooling (TEC) is optional and can be added to any of the models. Six different models are available, ranging from the –HR high resolution series to the –SR wide range models – perfect for any application!

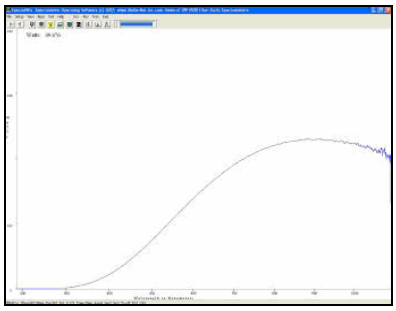
BLACK-Comet Model and Resolution Table			Estimated resolving resolution based on slit size				
Model	**Wavelength Range**	**Price**	**Slit-200um**	**Slit-100um**	**Slit-50um**	**Slit-25um**	**Slit-14um**
BLK-C	190-850nm	$2750	6.0	3.0	1.5	0.85	0.75
BLK-CXR	280-900nm	$2750	6.0	3.0	1.5	0.85	0.75
BLK-C-SR	200-1080nm	$3495	8.0	4.0	2.0	1.4	1.3
BLK-CXR-SR	220-1100nm	$3495	8.0	4.0	2.0	1.4	1.3
BLK-HR-UV	200-600nm	$2750	3.0	1.5	0.7	0.5	0.4
BLK-HR-VIS	350-780nm	$2750	3.0	1.5	0.7	0.5	0.4

StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA **www.StellarNet.us**
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279** **ContactUs@StellarNet.us**

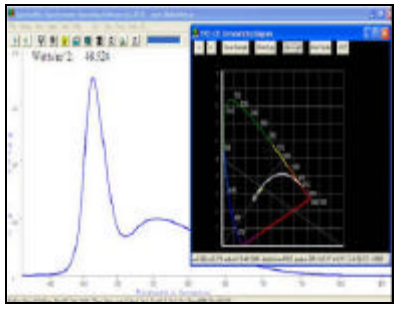
StellarNet BLACK-Comet Concave Grating Spectrometers for UV-VIS & NIR

StellarNet offers a variety of fiber optic sampling accessories for a multitude of applications with the BLACK-Comet spectrometer series. For SpectroRadiometric measurements, StellarNet offers NIST calibrated integrating spheres, cosine receptors, and lens attachments. High performance light sources, optical fibers, probes, and transmission/reflectance fixtures are available for any Optical Metrology and Colorimetry application. StellarNet also offers cuvette holders, dip probes, and flow cells for SpectroChemistry and Fluorimetry measurements.

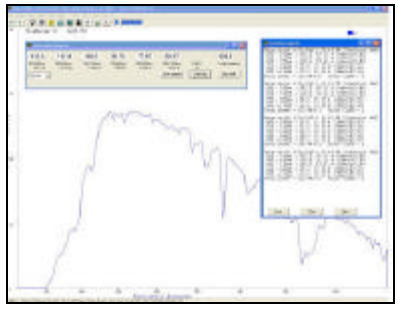
The SpectraWiz® software package, included free with every spectrometer, has many applications for spectroscopy. SpectroRadiometry applications include user defined calibrated absolute intensity modes (Watt/m², Lumen, Radiant/Luminous Flux, etc), CIELAB color analysis and color rendering, UVa/UVb/UVc monitoring, and solar simulator classification. Standard Optical Spectral Analysis tools such as FWHM, centroid, and peak wavelength are available with more advanced features such as baseline correction, data smoothing, spectral derivatives, and episodic data capture also included. ChemWiz® concentration analyzer creates a PLS method save and recall with concentration display the SpectraWiz ID® application provides element identification for LIBS/Plasma and OES. StellarNet also provides a developer's toolbox of source codes, customizable demo programs, and full spectroscopy programs in LabVIEW, Visual Basic, Delphi Pascal, and MS Visual C- ***All with your BLACK-Comet spectrometer***.



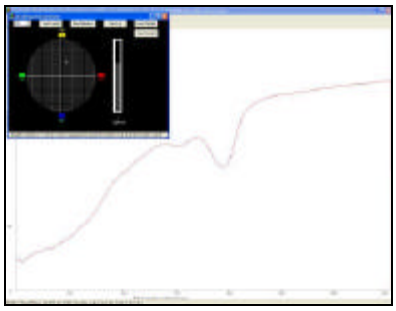
SpectroRadiometry
Tungsten-Halogen Lamp Spectra



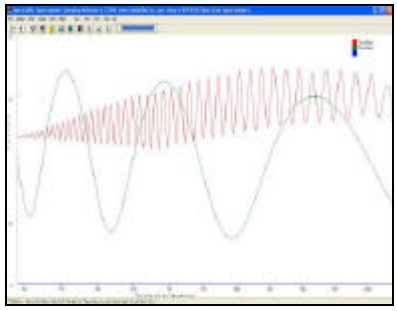
LED Metrology
Complete Analysis Systems



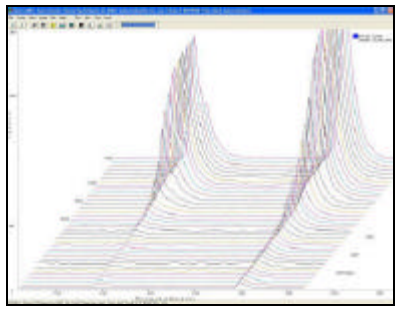
Solar Irradiance Measurements
and Simulator Classification



Reflectance Spectra and
Colorimetric Data for a Red
Habanero Pepper



Metrology of Films, Filters, and
Optical Components



Absorbance Chemistry and
Fluorimetry with high speed data
collection for kinetic study

Specifications			
Dynamic range:	2000:1 with 6 decades	Dimensions:	69mm x 100mm x 150 mm
Optical resolution:	see resolution table	Power consumption:	<100mA via USB2
Detector type:	2048 pixel CCD/PDA (opt)	Interface:	USB2 cable
Pixel size:	14um wide x 200um tall	Digitizer:	16-bit @ 2.5MHz rate
Detector Integration:	1ms to 65s	Stray light:	0.02% at 435nm; 0.2% at200nm
Slit size options:	14, 25, 50, 100, or 200um	Fiber optic input:	SMA905
Concave Grating:	Aberration corrected	Signal to noise:	1000:1
Grating type:	Holographic, 590g/mm	Operating systems:	Win98/Me/00/XP/Vista/7
Spectrograph:	f/2, Flat field – no mirrors	Software included:	SpectraWiz program & apps
Order sorting filter:	Integrated multi-band	Also **free** programs for:	LabView/VC/VBA/Delphi

StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA **www.StellarNet.us**
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279** **ContactUs@StellarNet.us**

www.StellarNet-Inc.com

Analytical Instrumentation

Surf the New Wave in Portable Fiber Optic Spectrometry

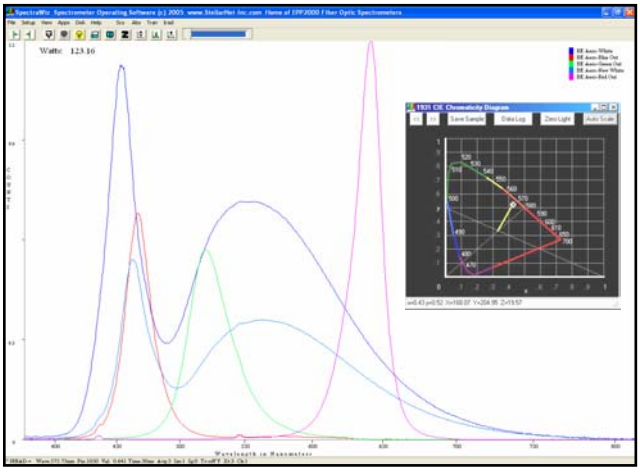
BLUE-Wave Miniature Fiber Optic Spectrometers for UV-VIS-NIR & OEM

The StellarNet BLUE-Wave Spectrometers are fiber optic coupled instruments with a wide selection of models for measurements in 190-1150nm wavelength ranges using a 16-bit digitizer via high speed USB-2.

Each unit contains a USB-2 interface with a snap shot memory to provide instantaneous spectral image from the highly sensitive CCD or Photo Diode Array detectors with options for 2048 or 3648 elements. Various models provide a choice of grating range and slit resolutions.

A single strand fiber optic cable or probe assembly delivers input via standard SMA 905 fiber optic connector with a choice of cable lengths. The spectrograph optics are exceptionally robust in a vibration tolerant modular design, with no moving parts. The detachable spectrograph assembly and

BLUE-Wave 16-bit USB2 Spectrometers



LED spectra of red, green, blue, white

control electronics are protected inside a rugged metal enclosure, suitable for portable, process, and lab applications. Several units may be daisy-chained using a powered USB2 hub allowing simple configurations for dual and multi-beam applications in chemistry, spectro-radiometry, PORTA-LIBS, and industrial process controls.

The SpectraWiz software is included to accurately measure light emission intensity for LED, Laser, plasma, solar, xenon, and so on. Measurement applications include SpectroRadiometry (NIST traceable intensities, LED xy chromaticty), Spectro-Colorimetry (CIELAB L* a* b*), Chemistry concentration/reaction time analysis, UVabc monitors, Spectral-ID of elemental plasma emissions, and more.

Specifications		**BLUE-Wave Spectrometers from $2500**	
Dynamic range:	2000:1 with 6 decades	Dimensions:	1x3x5 inch = 25x75x125mm
Optical resolution:	see model table - to 0.2nm	Weight:	14 ounces
Detector type:	CCD or PDA, 2k/3k pixels	Power consumption:	< 100 mA via USB port
Detector range:	200-1150nm (<350 extra$)	Interface:	USB-2 or USB-2 Hub
Pixel size:	14 x 200um or 7 x 200um	Detector Integration:	1ms to 65s
Diffraction Gratings:	Holographic & Ruled	Slit size options:	14, 25, 50, 100, 200um
Grating g/mm:	300, 600,1200,1800, 2400	Stray light:	<.1% at 435nm;<.05% at 600nm
Spectrograph:	f/4, SymX-Czerny–Turner	Fiber optic input:	SMA905 0.22na single fiber
Order sorting filters:	Integrated & High Pass	Operating systems:	Win9x, WinXP, Vista
Signal to noise:	1000:1	Software included:	SpectraWiz program & apps
Digitizer:	16-bit	Also **free** programs for:	LabView,Excel+VBA,Delphi

StellarNet Inc

14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

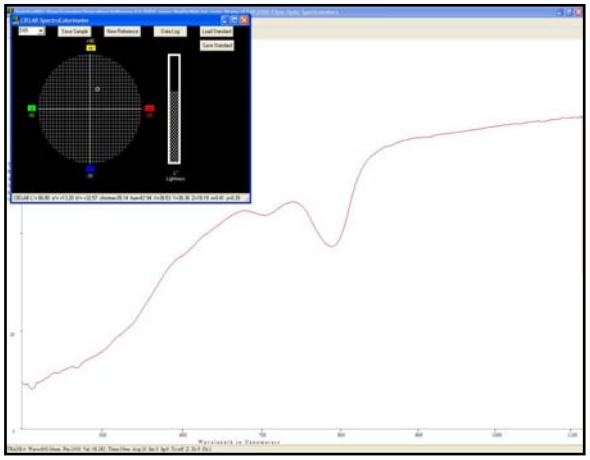
BLUE-Wave Miniature Fiber Optic Spectrometers for UV-VIS-NIR & OEM

Additional measurement applications include emission wavelength monitoring /characterization of tunable lasers or LED's and other sources such as elemental emissions from plasma & Laser Induced Breakdown Spectroscopy. Also Bragg grating technology enables optical sensing of many parameters including temperature and pressure. Thin film thickness measurements can be made using sample specular reflectance. The small size and weight makes the BLUE-Wave spectrometers just perfect for portable and OEM applications.

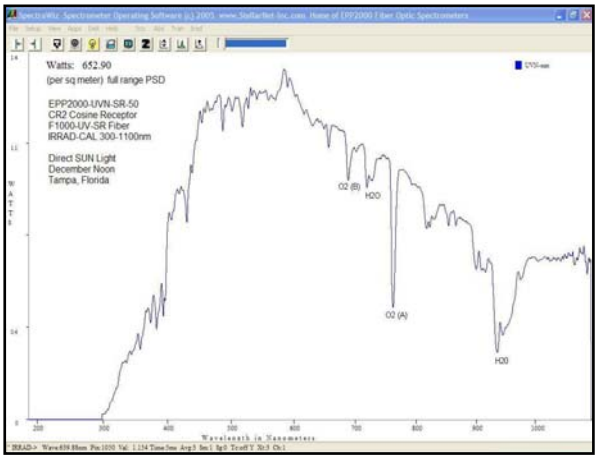
$200 extra cost for UV ranges below 350nm

BLUE-Wave Spectrometer Configurations		**2048 pixel CCD detector**	**Predicted Slit Resolving Resolutions**				
Model	Wavelength Range in nm	Grating g/mm	Slit-200 nm res.	Slit-100 nm res.	Slit-50 nm res.	Slit-25 nm res.	Slit-14 nm res.
UV	200-600	1200	3.0	1.6	0.8	0.50	0.40
UV2	200-400	2400	1.5	0.8	0.4	0.25	0.20
UV3	220-350	3600	1.0	0.5	0.25	0.16	0.13
UVIS	300-1100	600	6.0	3.2	1.6	1.00	0.80
VIS	350-1150	600	6.0	3.2	1.6	1.00	0.80
VIS2	380-780	1200	3.0	1.6	0.8	0.50	0.40
NIR	500-1150	600	6.0	3.2	1.6	1.00	0.80
NIR2	600-1000	1200	3.0	1.6	0.8	0.50	0.40
NIR2b	785-1150	1200	3.0	1.6	0.8	0.50	0.40
NIR3	550-840	1800	2.2	1.2	0.6	0.35	0.28
NIR3b	680-935	1800	2.2	1.2	0.6	0.35	0.28
NIR4	500-700	2400	1.5	0.8	0.4	0.25	0.20
NIR4b	600-800	2400	1.5	0.8	0.4	0.25	0.20
UVN	250-1100	600	6.0	3.2	1.6	1.00	0.80
UVNb	200-1050	600	6.0	3.2	1.6	1.00	0.80

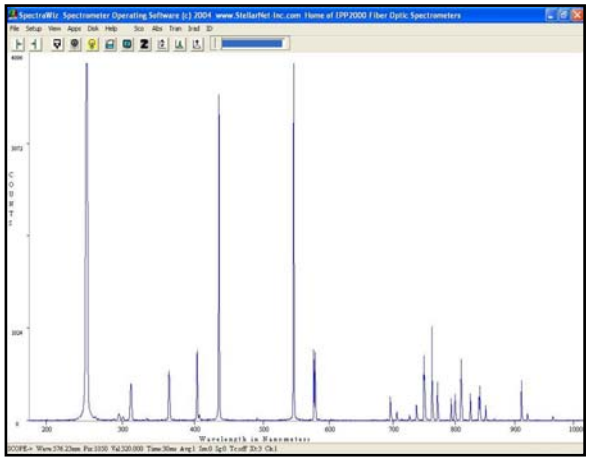
Note: multiply resolution by 0.57 for 3648 pixel PDA detector, range may shorten, check availability



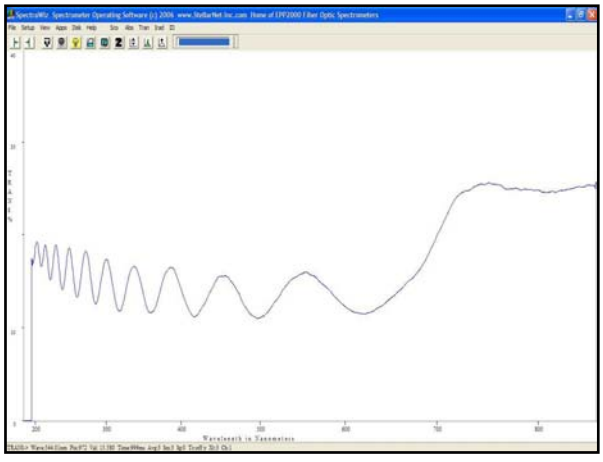
VIS color reflectance



UVN spectra of sunlight



UVN spectra of mercury+argon gas



UV-VIS spectra of a thin film

StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

www.StellarNet-Inc.com

Analytical Instrumentation

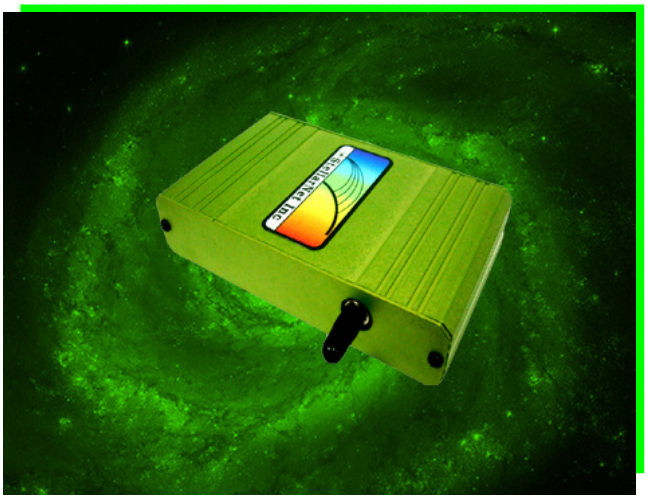
Surf the New Wave in Portable Fiber Optic Spectrometry

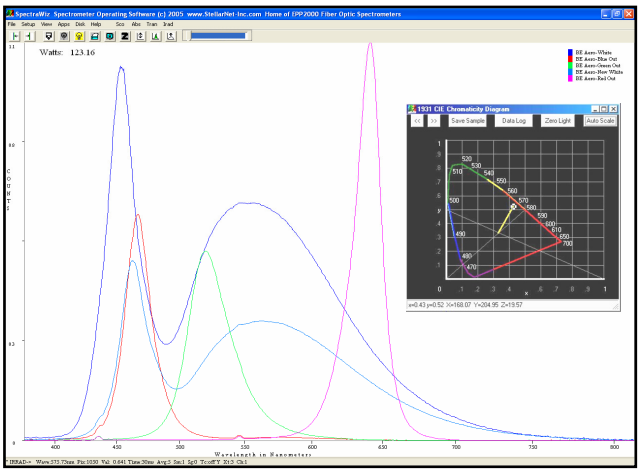
GREEN-Wave Miniature Fiber Optic Spectrometers for VIS-NIR & OEM

The StellarNet GREEN-Wave Spectrometers are fiber optic coupled instruments with a wide selection of models for measurements in 350-1100nm wavelength range.

Each instrument contains a USB2 interface with integrated memory buffer to provide instantaneous spectral image from the highly sensitive CCD detector with 2048 elements. Various models offer a choice of grating range and slit resolutions.

A single strand fiber optic cable or probe assembly delivers input via standard SMA 905 fiber optic connector with a choice of cable lengths. The spectrograph optics are exceptionally robust in a vibration tolerant modular design, with no moving parts. The detachable spectrograph assembly and





GREEN-Wave LED Spectra

control electronics are protected inside a rugged metal enclosure, suitable for portable, process, and lab applications. Several units may be daisy-chained using a standard USB hub allowing simple configurations for dual and multi-beam applications in chemistry, SpectroRadiometry, solar, and CIELAB color measurement.

The SpectraWiz software is included to accurately measure light emissions such as LED, Laser, plasma, solar, xenon, and others along with absolute intensities. Additional measurements include sample color reflectance, transmission, chemical absorption and concentration. Applications include SpectroRadiometry (NIST traceable intensities & LED xy chromaticty), SpectroColorimetry (CIELAB L* a* b*), SpectroChemistry reaction time-series analysis, UVabc monitors, Spectral-ID of elemental plasma emissions, and more.

Specifications		**GREEN-Wave Spectrometers from $1948**	
Dynamic range:	2000:1 with 6 decades	Dimensions:	1x3x5 inch = 25x75x125mm
Optical resolution:	see model table - to 0.2nm	Weight::	14 ounces
Detector type:	CCD - 2048 pixels	Power consumption:	< 100 mA via USB port
Detector range:	350 -1100nm	Interface:	USB2 or USB2 Hub
Pixel size:	14 x 200um	Detector Integration:	1ms to 5 seconds - no TEC
Diffraction Gratings:	Holographic & Ruled	Slit size options:	14, 25, 50, 100, 200um
Grating g/mm:	300, 600,1200,1800, 2400	Stray light:	<.1% at 435nm;<.05% at 600nm
Spectrograph:	f/4, SymX-Czerny–Turner	Fiber optic input:	SMA905 0.22na single fiber
Order sorting filters:	Integrated & High Pass	Operating systems:	Win9x, XP, Vista, Win7
Signal to noise:	400:1	Software included:	SpectraWiz program & apps
Digitizer:	16-bit	Also **free** programs for:	LabView,Excel+VBA,Delphi

StellarNet Inc

14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**

www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

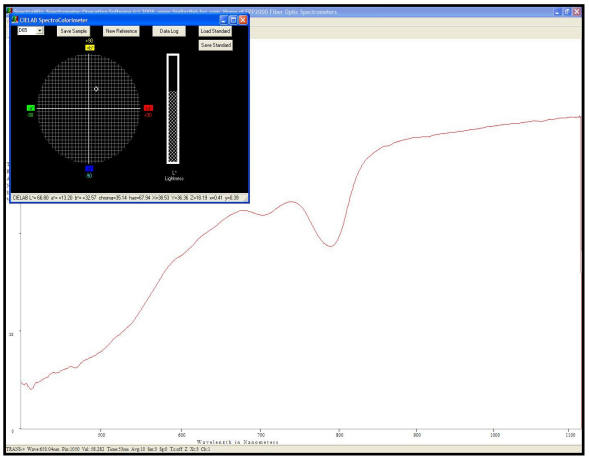
GREEN-Wave Miniature Fiber Optic Spectrometers for VIS-NIR & OEM

Additional measurement applications include emission wavelength monitoring /characterization of tunable lasers or LED's and other sources such as elemental emissions from plasma. Also Bragg grating technology enables optical sensing of several conditions such as temperature, pressure, and stress/strain (such as found in roadway bridges, tall building, or aircraft even wings).

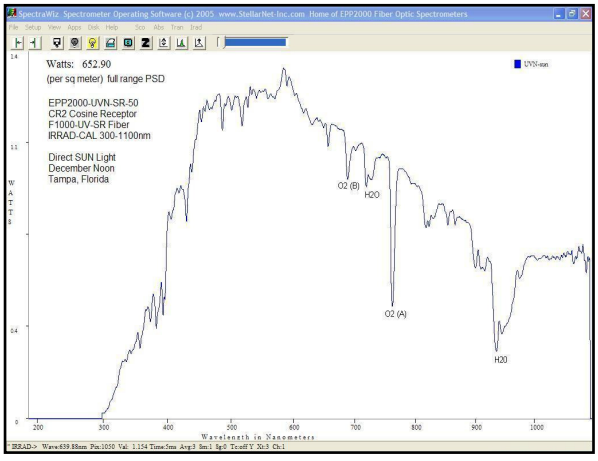
Thin film thickness measurements also can be made using sample specular reflectance. The small size and weight makes the GREEN-Wave spectrometers perfect for a variety of portable measurement applications.

GREEN-Wave Spectrometer Configurations			**Predicted Slit Resolving Resolutions**				
Model	Wavelength Range in nm	Grating g/mm	Slit-200 nm res.	Slit-100 nm res.	Slit-50 nm res.	Slit-25 nm res.	Slit-14 nm res.
VIS	350-1100	600	6.0	3.2	1.6	1.00	0.80
NIR	500-1100	600	6.0	3.2	1.6	1.00	0.80
NIR2	600-1000	1200	3.0	1.6	0.8	0.50	0.40
NIR2b	785-1150	1200	3.0	1.6	0.8	0.50	0.40
NIR3	550-840	1800	2.2	1.2	0.6	0.35	0.28
NIR3b	680-935	1800	2.2	1.2	0.6	0.35	0.28
NIR4	500-700	2400	1.5	0.8	0.4	0.25	0.20
NIR4b	600-800	2400	1.5	0.8	0.4	0.25	0.20

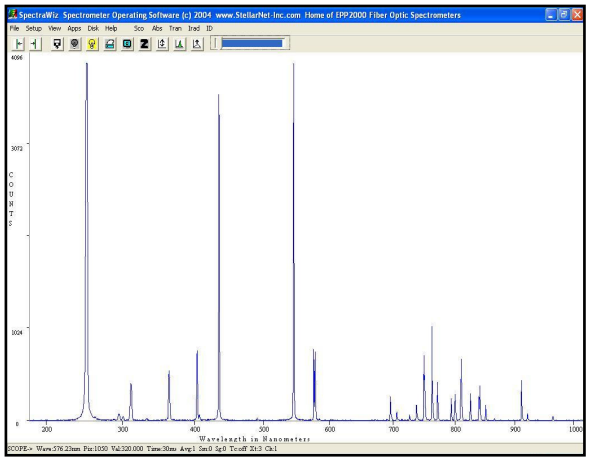
Note: DLENS optics to enhance sensitivity using 600/1000um fiber, or external TTL trigger, or UV ranges below 350nm are upgrades available only for BLUE-Wave spectrometers.



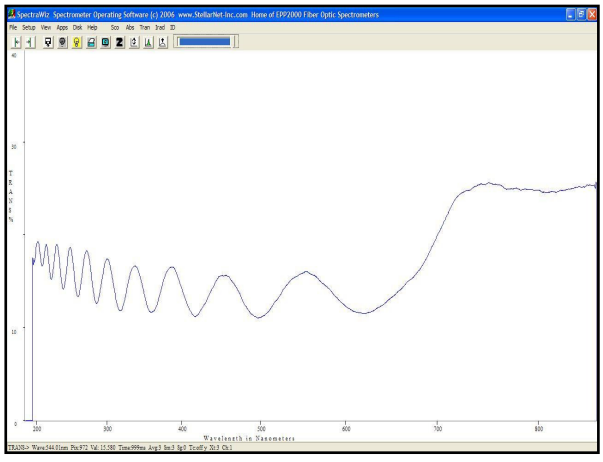
Transmission spectrum of yellow liquid



Irradiance spectrum of sunlight



Emission spectra of mercury+argon gas



Reflectance spectrum of a thin film

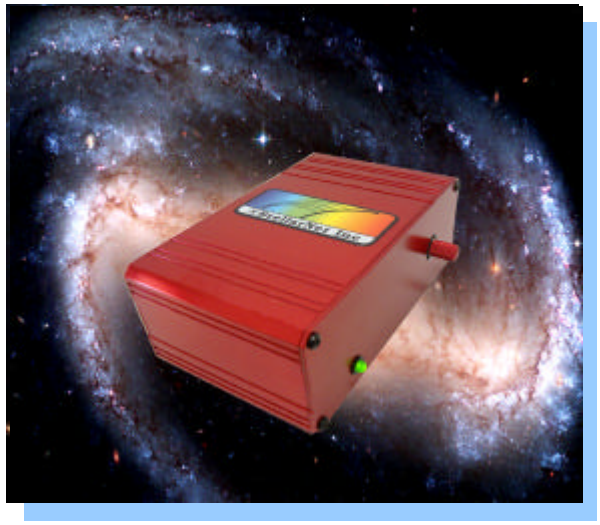
StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

www.StellarNet-Inc.com

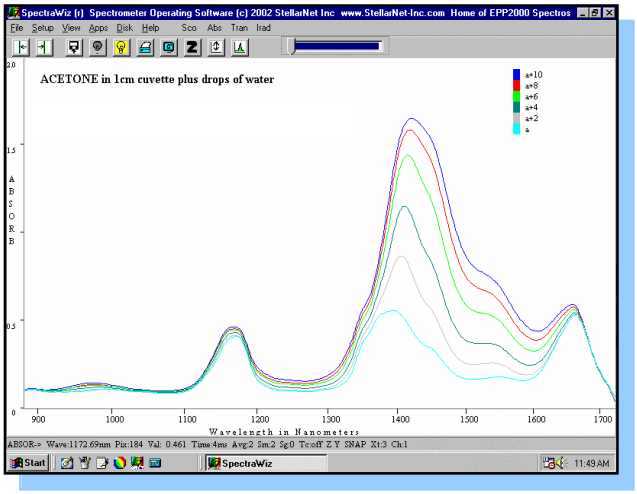
Analytical Instrumentation

Surf the New Wave in Portable Fiber Optic Spectrometry

DWARF-Star NIR Spectrometers for Portable & OEM Applications



StellarNet's newest NIR spectrometer, the ***DWARF-Star***, is small, robust, and equipped with high performance InGaAs detector array for the 900-1700nm wavelength range and can achieve resolving resolutions to 1.25nm. The DWARF-Star features no moving parts and is packaged in a small rugged metal enclosure (5"x3"x2") for portable, process, and OEM applications. Advancements in electronic and optical design have allowed for size reduction never before achieved in a NIR spectrometer. The InGaAs detector is a linear photo diode array with 512 pixels (1024 are optional) which are 25 x 500µm tall to provide maximum sensitivity. The detector has an integrated thermo electric cooler (TEC) set to maintain –10 °C within +/-0.1 °C. The NIR spectrometers accept a single strand SMA-905 terminated low OH fiber optic cable as input. Several models provide a variety of operational ranges and resolutions suitable for both spectroscopy and optical spectrum analysis. Each DWARF-Star includes free SpectraWiz® Software and a developer's toolbox of source codes, customizable demo programs, and full spectroscopy applications in LabVIEW, Visual Basic, Delphi Pascal, and MS Visual C. High speed spectral data acquisition with advanced features, such as time series analysis, episodic data capture, and rapid sample logging are standard features. Post processing techniques such as baseline correction, data smoothing, and spectral derivatives are included. Additionally, add-on chemometrics packages are available for complete multivariate calibration, analysis, and run-time with the DWARF-Star.



Specifications	DWARF-Star NIR Spectrometer $13,125		OEM Pricing available
Dynamic range:	4000:1 with 5 decades	Dimensions:	5"x3"x2"
Resolving resolution:	2.5nm 512 pixel 25µm slit	TEC Power	1.5 Amps @ 5 VDC
InGaAs PDA Detector:	512 pixel (1024 optional $)	Interface:	USB-2
Detector range:	900-1700nm	Data transfer speed:	40x faster than USB-1
Pixel size:	25um x 500um tall	Detector Integration:	1 millisecond to 30 secs
Pixel well depth:	130 x10^8 electrons	Slit size options:	25um
Selectable well control:	130 x10^8 or 5 x10^6 el.	Operating systems:	XP/Vista/ Win 7
Signal to noise:	4000:1 with TEC cooling	Digitizer:	16 bit @ 2.5 MHz rate

StellarNet Inc

14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

DWARF-Star InGaAs NIR Spectrometers for Portable and OEM Applications

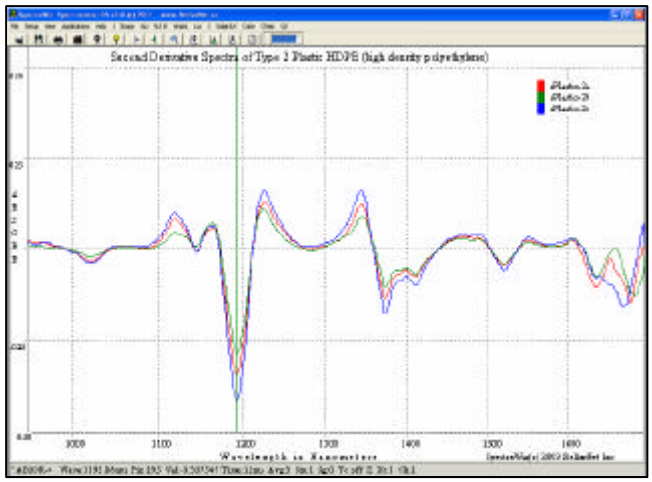
The StellarNet DWARF-Star fiber optic spectrometers are available in several models to provide optimal ranges and resolutions for various NIR applications in the 900-1700nm range. The standard detector is a 512 element photo diode array with 25 x 500µm tall pixels and has zero defects.

The instruments interface to a PC via USB-2 and can be operated simultaneously with StellarNet UV-VIS spectrometers to provide a Dual-Detector Super-Range (Dual-DSR) spectroscopy system. StellarNet also offers light sources, probes, and sampling accessories to facilitate virtually any NIR application. The miniature DWARF-Star NIR spectrometer is ideal for process analytical technology for industries such as food and drug, chemical, oil and gas, and plastics. The DWARF-Star's miniature size, low cost, and rugged design also make it ideal for the field, enabling on-site product analysis and quality control never before attainable.

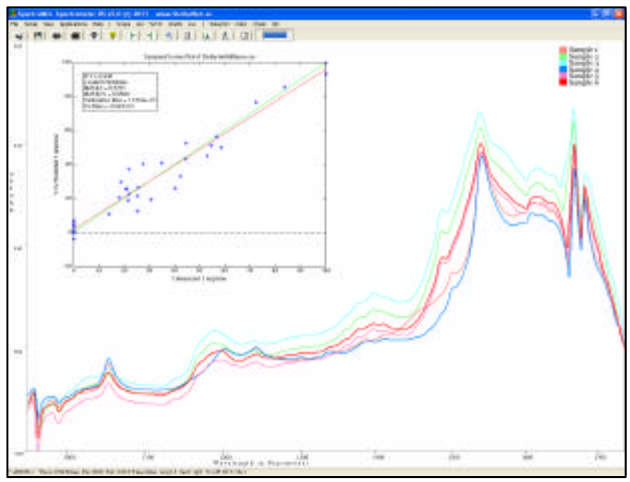
DWARF-Star Standard Models

InGaAs Model	Number of Elements	Spectrometer Range (nm)	Grating (g/mm)	Grating Range (nm)	Dispersion (nm/pixel)	Estimated Resolving Resolution
NIR	512	900-1700	250	800nm	1.25	2.50nm
NIRb	512	1000-1700	300	650nm	1.00	2.00nm
NIR2	512	1250-1575	600	325nm	0.50	1.00nm
NIR2b	512	1150-1475	600	325nm	0.50	1.00nm
NIR	1024	1000-1700	600	700nm	0.62	1.25nm

The optical resolution is based on the grating range obtained by the StellarNet spectrograph and a 512 pixel detector to yield the dispersion. A 25µm slit will image onto one 25µm pitch pixel, and possibly 2, therefore our estimate of resolving resolution uses a factor of 2 times the dispersion. Actual resolutions may vary from the estimates shown. Multiply x2 for FWHM.



Spectrum from DWARF-Star-512 showing 2nd Derivative spectral reflectance of type-2 plastics

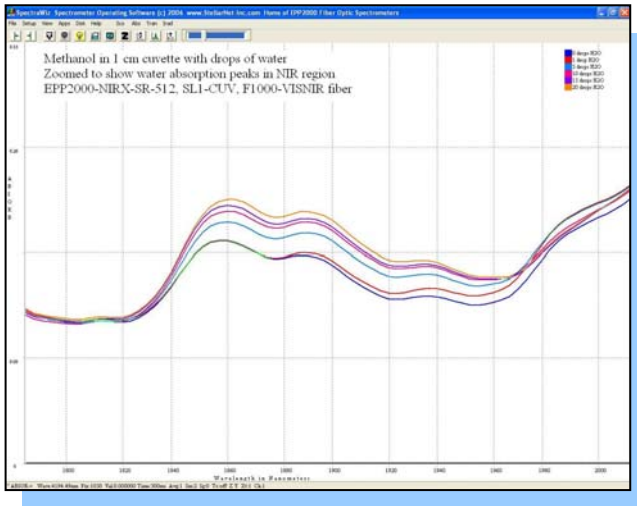


SpectraWiz software interface displaying raw NIR reflectance spectra of dietary supplement powders with inset multivariate calibration model

StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

RED-Wave-NIR*x*-SR InGaAs Spectrometers for "Super Range" 0.9-2.3 µm

The **RED-Wave-NIRx-SR** spectrometers cover the NIR wavelength range from 0.9-2.3µm in one instrument using extended range InGaAs detectors. The spectrometers are exceptionally robust with no moving parts and are packaged in small rugged metal enclosure (2.75" x 4" x 6") for portable, processes, and lab applications. The InGaAs detector is a Sensors Unlimited linear photo diode array with **512** pixels (**1024** optional) 25µm by 500µm tall to provide maximum sensitivity. The detector has an integrated two-stage thermo electric cooler (TEC) maintained at –20 °C, stabilized within +/-0.1°C. The **RED-Wave-NIRx-SR** InGaAs spectrometers use single strand low OH fiber optic input cable with SMA905.



Methanol with drops of water in cuvette

Extended range NIR applications include chemical ID of samples using molecular absorption. Liquids samples are measured via cuvette, Dip probe, and flow cell for process monitoring of concentrations. Photonics applications include optical transmission characterization of materials for filter/coating applications. Laser and tunable laser wavelength monitoring, and *micro-sensor* applications.

The **RED-Wave** includes a high speed USB-2 interface cable to interface with notebook and desktop computers. SpectraWiz software is included for a variety of spectroscopy measurements.

Specifications	**RED-Wave-NIRx-SR**	**Spectrometer with InGaAs-512X $17,995**	
Dynamic range:	4000:1 @ 5 milliseconds	Dimensions:	150 x 100 x 68.8 mm
Optical resolution:	13nm with 25µm slit	Power consumption:	2 Amps @ 5 VDC
InGaAs Detector:	512 pixel cooled PDA array	Interface:	USB-2
Detector range:	0.9-2.3µm (900-2300nm)	Data transfer speed:	3x / 40x faster than USB-1
Pixel size:	25µm x 250µm	Detector Integration:	1 to 250 milliseconds
Pixel well depth:	130 x10^8 electrons	Slit size (um):	25/50/100/200um
Selectable well control:	130 x10^8 or 5 x10^6 el.	Operating systems:	Windows XP/VISTA
Signal to noise:	400:1 with 2x TEC cooling	Software included:	SpectraWiz program & apps
Digitizer:	14/16 bit @ 2.5 MHz rate	Also **free** programs for:	LabView,Excel+VBA,Delphi

StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

RED-Wave-NIR*x*-SR InGaAs Spectrometers for "Super Range" 0.9-2.3 µm

The SpectraWiz® software is included **FREE** for Windows to accurately measure wavelengths of emissions, reflectance, transmission, and absorption. Customizable programs and drivers are also included for operation in LabVIEW, Excel +VBA, VC, and Delphi.

The **RED-Wave**-NIR**x**-SR InGaAs spectrometers are available in two models to provide optimal resolutions for various NIR applications in the extended 0.9-2.3um range. The standard detector is a 512 element photo diode array (PDA) with 25 x 500µm tall pixels and has zero defects. An optional 1024 element InGaAs PDA will double the resolution over the same range, however it can have 1% non-adjacent dropout pixels. The SpectraWiz software driver provides correction for any dropouts.

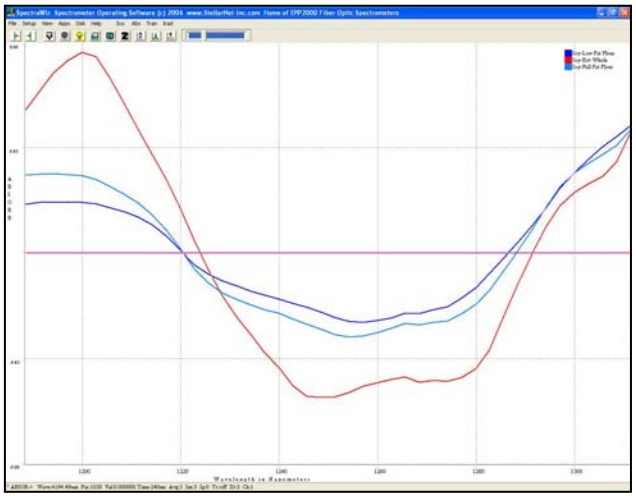
Because of reduced sensitivity the extended range systems are primarily used for measuring chemical absorption and transmission in flow cells, dip probes, cuvettes, and optics.

X

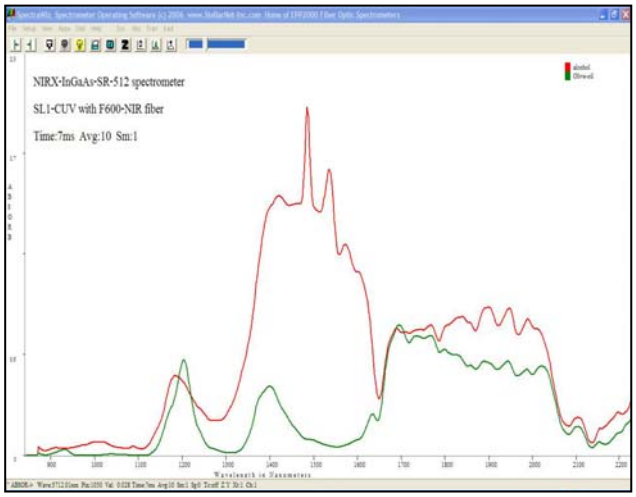
InGaAs Model	# of Array Elements	Wavelength Range (nm)	Grating (grooves/mm)	nm/pixel dispersion	Estimated Resolution (nm)
NIR*x*-SR	512	900-2300	300	5.3	<13nm
NIR*x*-SR	1024	900-2300	600	2.7	<7nm

The optical resolution is based on the grating range obtained by the StellarNet spectrograph and a 512 pixel detector to yield the dispersion. A 25µm slit will image onto one 25um pitch pixel, and possibly 2, therefore our estimate of optical resolution uses a factor of 2 times the dispersion. Measured resolution may vary from the estimates shown.

All NIR*x*-SR units can be coupled with StellarNet's BLACK-Comet or UVN-SR units to cover the entire 200-2300nm range. Coupling the units can provide you with quick analysis of color in the VIS spectrum and compound fingerprint identification in the NIR.



RED-Wave-NIR*x*-SR-InGaAs-512 spectrum showing 2nd Derivative spectral reflectance data of various soybeans (whole, low-fat, and full-fat. The RFX-1 integrated sampling accessory/light source was used for simple reflectance measurements with no sample prep required.



RED-Wave-NIR*x*-SR-InGaAs-512 spectrum showing % Transmission data of alcohol and oil samples for 900-2200nm range. Data obtained with SL1-CUV which is an integrated halogen light source + cuvette holder.

StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

StellarNet App-note: Dual-DSR (Dual-Detector Super Range) Spectrometer Instrumentation for 0.2-2.3um Wavelength Ranges

➢Dual-Detector instruments for super range

•Two instruments work as one updating spectral graph

•UV-VIS detector array plus NIR-InGaAs arrays

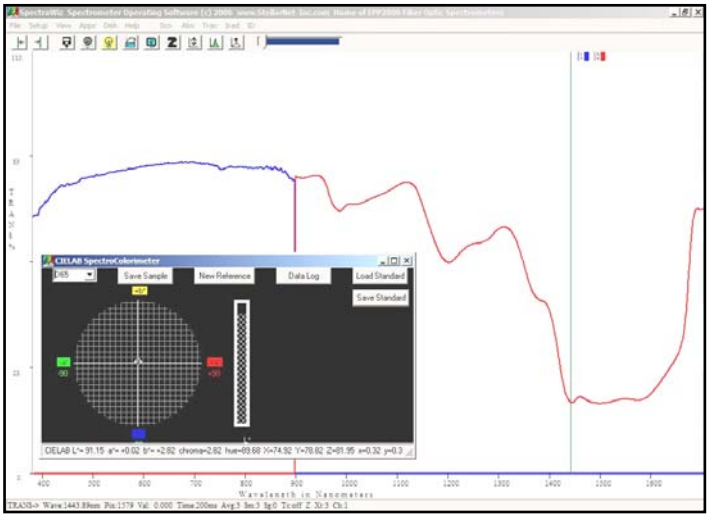
•2048 element UV-VIS plus 512 and 1024 element NIR

•Ranges for 200-1700nm, 280-1700nm, 200-2300nm

•Ruggedized for field or lab process measurements

•Miniature USB-Hub provides instrument PC interface

•Applications for SpectroRadiometry, food and pharm-aceutical QA/QC, and chemical process measurements



Dual-DSR reflectance spectrum of white sugar showing color and CH composition using TXF1 reflectance fixture for 280-1700nm

➢Spectroradiometric Calibrations

•**Optional IRRAD-CAL turns system into a SpectroRadiometer** covering 200-1700nm

•**Variety of accessories** – reflectance probe/stand, transmission fixtures, and cuvettes for absorbance.

➢Sample Color and Composition

•Measure sample CIELAB color and quantitative composition simultaneously

•Fast, easy results with little to no sample prep using reflectance fixture.

Item	Dual-DSR Instrument Descriptions	Price
DSR-CXR-512	Concave grating (UV-VIS, CCD) plus NIR-512 (InGaAs PDA) for 280-1700nm	$ 15,875
DSR-UVN-512	UVN-SR (UV-VIS-NIR, CCD) plus NIR-512 (InGaAs PDA) for 200-1700nm	$ 16,620
DSR-UVN-1024	UVN-SR (UV-VIS-NIR, CCD) plus NIR-1024 (InGaAs PDA) for 200-1700nm	$ 21,190
	DSR instruments listed below cannot be spectroradiometrically calibrated	
DSR-CXR-512*X*	Concave grating (UV-VIS, CCD) plus NIR*X*-512 (InGaAs PDA) for 280-2300nm	$ 20,745
DSR-UVN-512*X*	UVN-SR (UV-VIS-NIR, CCD) plus NIR*X*-512 (InGaAs PDA) for 200-2300nm	$ 21,490
DSR-UVN-1024*X*	UVN-SR (UV-VIS-NIR, CCD) plus NIR*X*-1024 (InGaAs PDA) for 200-2300nm	$ 26,745

EPP2000 High Resolution Spectrometers - for UV-VIS-NIR Applications

The EPP2000-HR High Resolution fiber optic spectrometers are available in several low cost models for UV, VIS, and NIR applications.

The HR spectrometers have double the resolution over standard models with the same grating. The wavelength range is reduced by the same factor. Resolutions better than 0.1nm can be achieved depending on selected model range, detector, and slit size.

Applications include wavelength monitoring and characterization for tunable lasers/LEDs and other sources such as elemental emissions from plasma & Laser Induced Breakdown Spectroscopy. Also, optical sensing of temperature, pressure, & position are enabled via Bragg grating technology.

EPP2000 High Resolution Configurations					**Predicted Slit Resolutions**		
Model	Wavelength Range in nm	Grating g/mm	Grating Range	Nm/pixel Dispersion	Slit-25 nm res.	Slit-14 nm res.	Slit-7 nm res.
UV3	200-340	1800	140	0.068	0.30	0.20	0.10
UV4	200-300	2400	100	0.048	0.21	0.14	0.07
NIR2	900-1075	1200	175	0.085	0.26	0.17	0.09
NIR3	750-850	1800	100	0.049	0.15	0.10	0.05
NIR4	500-580	2400	80	0.039	0.12	0.08	0.04
UVN-SR	200-1100	* 300	900	0.440	1.50	1.00	0.50

Specification	**EPP2000HR-UV-VIS-NIR Spectrometers $2995**		
Dynamic range:	2000:1 with 6 decades	Dimensions:	44 x 94 x 150 mm
Optical resolution:	see model table - to 0.1nm	Power consumption:	100 mA @ 5 VDC
Detector type:	2048 pixel CCD	Interface:	USB-2 and/or EPP Parallel
Detector range:	200-1200nm	Data transfer speed:	40x faster than USB-1
Pixel size:	14um x 200um	Detector Integration:	1ms to 65s
Diffraction Gratings:	Holographic & Ruled	Slit size options:	7, 14, 25, 50, 100, 200um
Grating g/mm:	300, 600,1200,1800, 2400	Stray light:	<.1% at 435nm;<.05% at 600nm
Spectrograph:	f/4, SymX-Czerny–Turner	Fiber optic input:	SMA905 0.22na single fiber
Order sorting filters:	Integrated & High Pass	Operating systems:	Win9x/WinXP/Vista/Win7
Signal to noise:	1000:1 CCD	Software included:	SpectraWiz program & apps
Digitizer:	16-bit or 14-bit	Also **free** programs for:	LabView,Excel+VBA,Delphi

EPP2000-UVN-SR Super Range Spectrometer for UV-VIS-NIR Applications

StellarNets' UVN-SR fiber optic spectrometer covers the **200-1100nm wavelength range** and easily performs a variety of spectroscopy measurements with the SpectraWiz software. The optics utilize a UV enhanced CCD or PDA detector array configured with **eXtreme grating** technology to deliver high efficiency in both UV & NIR spectral extremes. The **eXtreme optics** include an integrated multi-band order sorting filter and UV enhanced detector array with optical lens to provide maximum sensitivity.

The UVN-SR can be optionally calibrated for use as a **SpectroRadiometer** when precision measurement of light color and absolute intensity is needed. A 25um slit or larger is recommended for best spectroradiometric performance coupled with a 1000um core diameter fiber input (via standard SMA 905 connector).

Solar spectrum December noon Tampa, FL

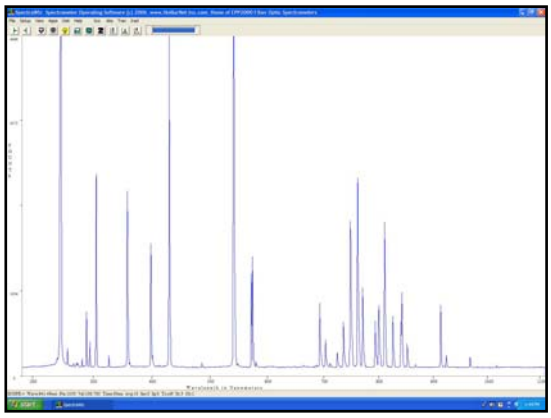
The portable instrument is packaged in a small rugged metal enclosure for use with single strand fiber optic input cable. The electronics interface can be attached directly to a computers high speed USB-2 port or high speed IEEE1284 enhanced parallel port (EPP). The units are vibration tolerant and are exceptionally robust with no internal adjustments or moving parts.

SpectraWiz software is included (free) to enable spectroscopy measurements (reflectance, transmission, absorption, and the many types of light emissions). Applications are included for SpectroColorimetry (CIELAB L*, a*, b*, ΔE*), SpectroRadiometry (absolute intensities watts m^{-2}, lumens m^{-2}, xy chromaticity, purity, CCT, moles m^{-2} s^{-1} etc.), Chemical concentrations, material identification, analysis of UVabc components, event or reaction monitoring data capture & time series analysis.

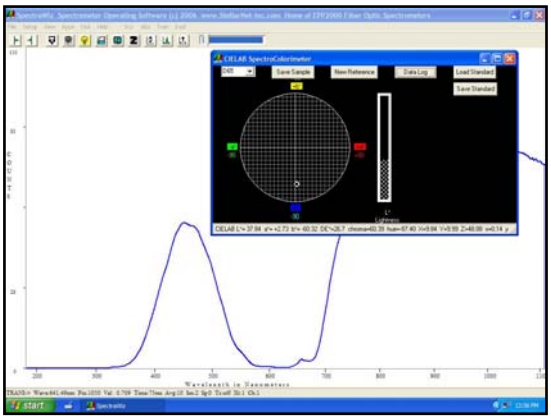
Specifications		**EPP2000-UVN-SR Spectrometer $3495**	
Dynamic range:	2000:1 with 6 decades	Dimensions:	6 x 17 x 20.5 cm
Optical resolution:	1nm - 14um slit & CCD	Power consumption:	100 mA @ 5 VDC
Detector type:	2048 pixel CCD	Interface:	USB-2.0 and/or EPP Parallel
Detector array:	200-1100nm with DLENS	Data transfer speed:	1ms - 40x faster than USB-1
Pixel size:	14um x 200um	Detector Integration:	1ms to 65s
eXtreme Grating:	Dual blaze @ 250+1000nm	Slit size options:	7, 14, 25, 50, 100, 200um
Grating type:	Holographic, 600 line	Stray light:	0.1% > 435nm .15% at 200nm
Spectrograph:	f/4, HR Czerny–Turner	Fiber optic input:	SMA905 0.22na single fiber
Order sorting filter:	Integrated multi-band	Operating systems:	Win9x/XP/Vista/Win7
Signal to noise:	1000:1 CCD	Software included:	SpectraWiz program & apps
Digitizer:	16bit or 14-bit	Also **free** programs for:	LabView/VC/Excel/Delphi

StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

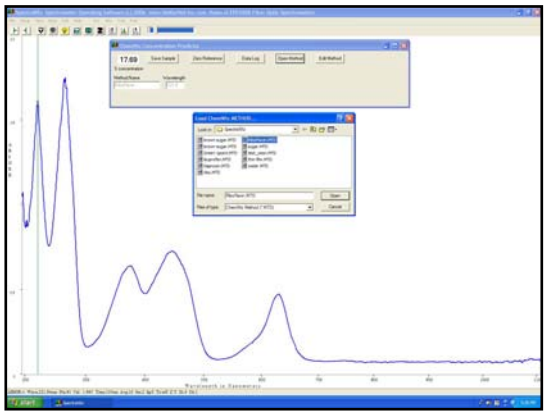
EPP2000-UVN-SR Super Range Spectrometer for UV-VIS-NIR Applications



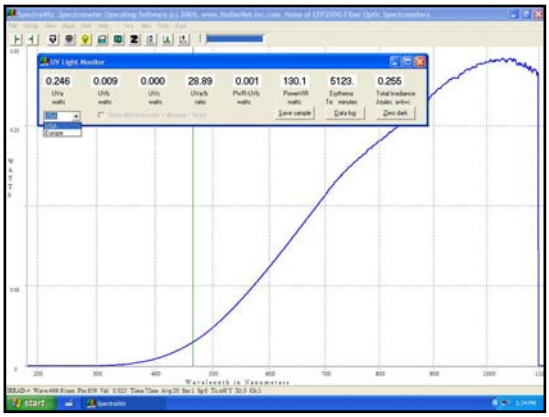
Emission Spectra of Mercury and Argon gas using SL2 WaveCal Lamp



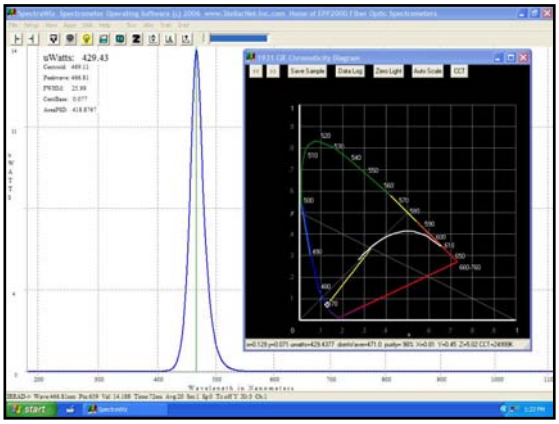
Reflectance Spectra of Blue Paper » CIELAB color measure & compare



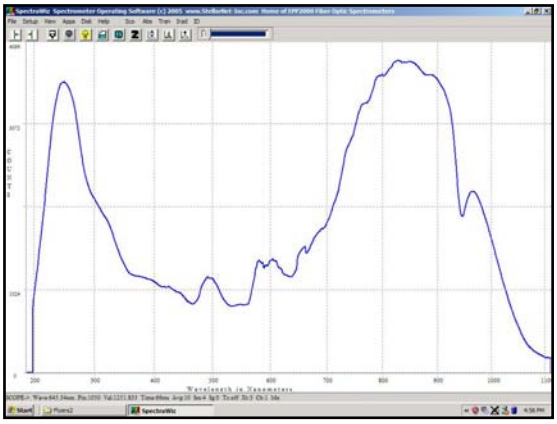
Absorbance Spectra of RiboFlavin » ChemWiz concentration Methods



Irradiance Spectra of White Light » UV Monitors UVa, UVb, UVc, Te..



Emission Spectra of 470nm Blue LED » 1931 xy Chromaticity Diagram



Reference Spectra of Deuterium + Halogen lamps using SL5-DH source

14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

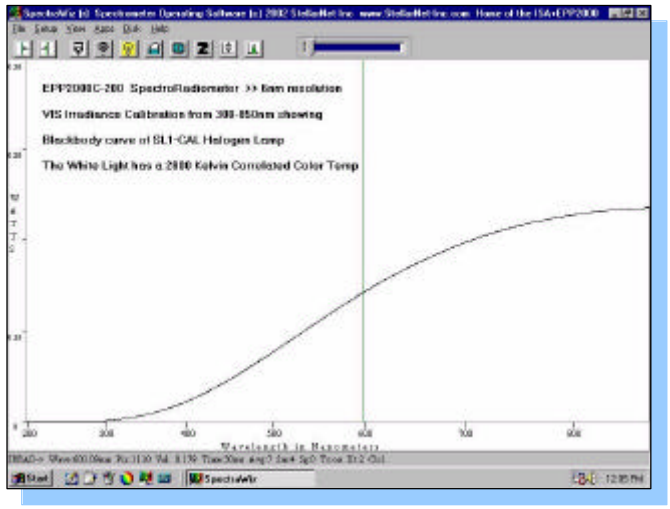
SL1 Tungsten Halogen Light Sources for VIS - NIR

SL1 **SL1-CUV**

SL1-FILTER

- **350 nm-2200nm Spectral Range-** effective for color, reflectance, transmittance, and absorbance measurements
- **Extensive Life-** The SL1 has a 10,000 hour Tungsten Halogen lamp filled with Krypton gas
- **Great Compatibility/Versatility-** manipulate output with color-enhancing or signal-attenuating filters.
- **Small Footprint-** measures only 1.5” x 3” x 3.5”
- **Maximum Flexibility-** several models and options to choose from to meet all your application needs.

- **The SL1-CUV** adds a 1cm cuvette holder with integrated collimating lens. Dual purpose allows the collimating lens to be demounted for far field emission monitoring.
- **The SL1-FILTER** includes a 0.5” diameter filter holder nose cone. Customers can use a variety of filters for spectral attenuation, band pass, and more. Includes filter to improve blue sensitivity.
- **SL1-BAT** is a unique option that adds a jack to any SL1 so it can be powered from +5VDC. Users can achieve complete portability with the BP1 or BP2 battery pack for the spectrometer *and* the SL1-BAT.
- **SL1-CAL** is configured specifically for Irradiance calibrations (300-1100nm). A CD is supplied with intensity data used to calibrate a SpectroRadiometer.



SL1 Tungsten Halogen Black Body Spectrum

SL1 Light Sources and Accessories

Item	Description	Price
SL1	SL1 Tungsten-Halogen light source	$375
SL1-Filter	SL1 light source with filter holder nose and filter.	$595
SL1-CUV	SL1 light source with integrated cuvette holder	$655
SL1-CAL	SL1 light source with data CD for 300-1100nm	$750
SL1-BAT	Optional connector allows +5V battery operation	$50
SL1-BLUE	SL1 with 470nm Blue LED, replacing halogen bulb	$375

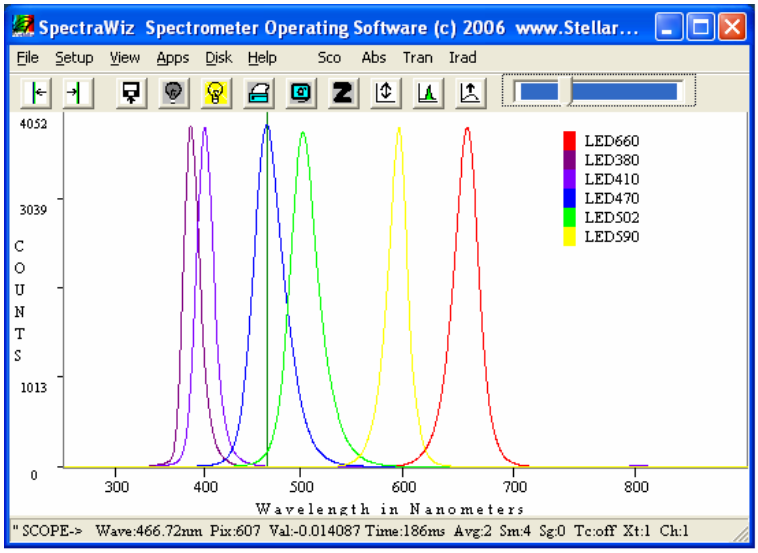
Specifications

Weight	0.62 pounds (280 g)	**Output to bulb**	5VDC
Power consumption	12 Watts	**Output regulation**	0.2%
Spectral range	350 – 2200nm	**Internal filter accessory**	2” square filter slot
Time to stabilize output	1 min	**External filter slot**	SL1-Filter only
Power output	200 W/m^2	**Bulb life**	10,000+ hours
Optical color temperature	~2800K	**Connector**	SMA 905

SL1-BLUE and SL1-LED Excitation Sources

- **Spectral Range-** LED dependant, optional white.
- **Extensive Life-** LEDs have extremely long life.
- **Flexibility-** user replaceable LEDs take less than a few seconds to replace.
- **Small Footprint-** only 1.5" x 3" x 3.5".
- **Maximum Flexibility-** Swappable LED option.
- **Powered Flexibility-** 12VDC standard or 5VDC option.

- **The SL1-Blue** is a miniature light source with a very bright 470nm LED installed. A collimating lens is installed just in front of the SMA fiber optic connector output used for fluorescence excitation.
- **The SL1-LED** includes a nose cone assembly with an LED kit consisting of 6 LEDs plus a White LED. LEDs can be swapped without any wiring changes, just pull one out and push the next one in. Each LED can be used to induce fluorescence in many experiments. 470nm LED works best for Riboflavin (vitamin D). Other wavelengths can be found more optimal for use with different species chemistry.
- **SL1-BAT** is a unique option that adds a jack to the SL1 so it can be powered from 5VDC. Users can achieve complete portability with the BP1 battery pack for the spectrometer *and* the SL1-BAT.



LED Emission Spectra can be used for Fluorescence Excitation

Excitation Sources and Accessories

Item	Description	Price
SL1-Blue	Miniature fiber optic light source with bright blue LED at 470nm for excitation.	$375
SL1-LED	Miniature fiber optic light source with replaceable LED. Includes LED-Kit with set of 6 LEDs: LED-410, LED-470, LED-502, LED-590, LED-660, LED-white	$695
SL1-BAT	Option connector allows +5V battery operation	$50

Specifications

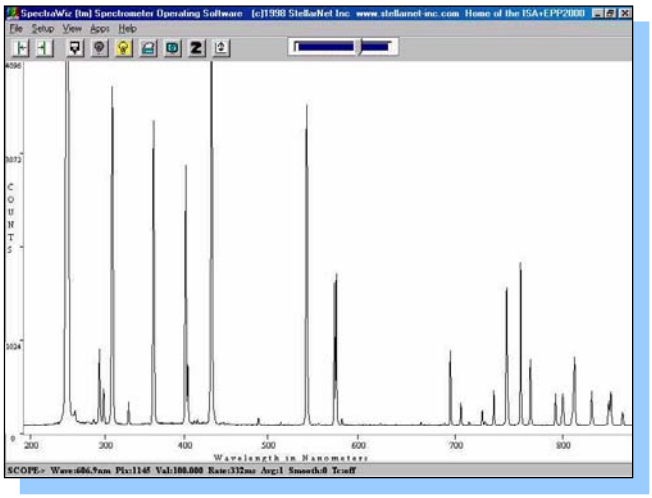
Weight	0.62 pounds (280 g)	**Output to bulb**	5VDC
Power consumption	0.5 watts	**Output regulation**	0.2%
Spectral range	Depends on LED installed	**Internal filter accessory**	2" filter slot
Time to stabilize output	~ 1 second	**External filter slot**	0.5" diameter
LEDs in Kit	410, 470, 502, 590, 660nm, and White LED	**LED life**	100,000 hours
LED Type	T-5 mm	**Connector**	SMA 905

SL2 Wavelength Verification Standard for UV-VIS-NIR

- **Calibration Source**- Verify or calibrate spectrometer wavelengths from 253.65 to 1013.98nm
- **Convenient Operation-** Includes U.S. style 5 Volt DC output power adapter for AC supply and optical fiber to check any spectrometer
- **Portable-** Miniature size 0.75 x 2.5 x 4.5 inch provides ultimate portability with 9 Volt DC battery operation makes the SL-2 perfect for field verifications

- The **SL2** fiber optic cal lamp provides Mercury and Argon gas emission lines which are utilized to verify or calibrate spectrometer wavelengths from 253.65 to 1013.98nm.
- The lamp is designed so that the low-pressure emissions enable quick and accurate calibrations. A labeled chart provides spectral emission lines for Mercury and Argon at various wavelengths for easy and quick reference.
- Portable operation is available from a standard 9 Volt DC battery (not included). The SL2 also includes a 5 Volt DC wall adapter for 120 Volt AC, U.S. style transformer and plug. Operation outside U.S. requires SL2-Y-cable or UP5V adapter.

  Note: the StellarNet spectrometers are wavelength calibrated at the factory using the SL2 and additional emission line sources. These instruments are ruggedized for portability and never need to be re-calibrated. The SL2 can be used to easily verify any wavelength readouts.



SL2 Light Emission Graph of HgA line Spectra

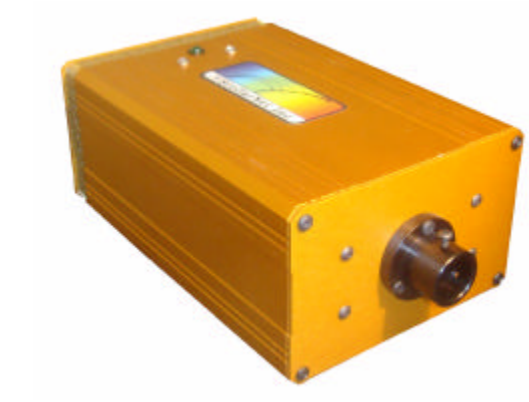
Light Sources and Fiber Optic Accessories

Item	Description	Price
SL2	Mercury and Argon standard	$275
SL2-Y-cable	Shares +5VDC from spectro	$15

Specifications

Weight	0.2 lbs, or 85 grams	**Connectors**	SMA-905 and +5 VDC
Power consumption	100ma	**Battery operation**	+9 VDC (optional)
Spectral Range	253.65 to 1013.98	**Time to stabilize output**	15 seconds

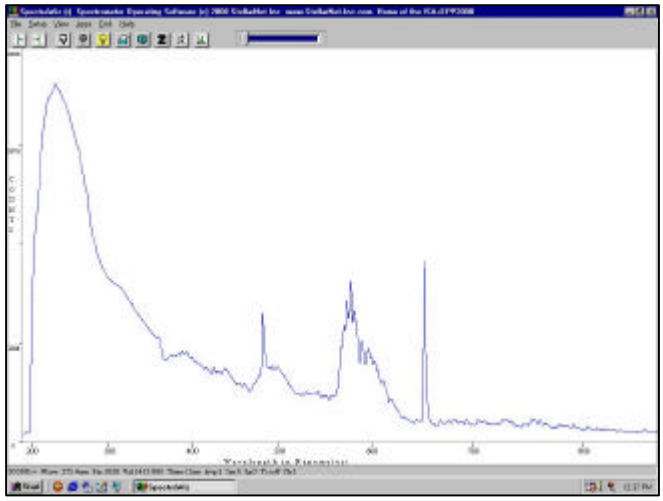
SL3 Deuterium Light Source for UV



Worlds smallest 4000 hour deuterium light source for CW (continuous wave) UltraViolet for the 190-450nm range.

- **UV Spectral Range** - covers the deep UltraViolet spectral range from 190-450nm**.**
- **Long Life** - 4, 000 hour performance due to special air flow design and ultra quite fan operation. One of our U.K. customers has reported continuous operation for over a year!
- **Exceptional Performance** - designed for maximum stability with precision power control it is ideal for UV spectroscopy.
- **Portability** - small size allows for use in field or mobile spectroscopy applications.

- **The SL3 Deuterium Light Source** - emits a deep UV spectral output over the 190- 450nm range and higher. When using the StellarNet concave grating spectrometers, the SL3 level is good past 550nm. See the comparison graph showing spectral curves from concave grating and CT grating spectrometers.
- **DCX Lens Option** - This add-on option increases the deuterium lamp intensity x7 times, and is highly recommended for highly absorbing samples and reflectance measurements.
- **Filter Options** - Integrated filter holder fits standard size 0.5 inch diameter disk filters. The U330-filter removes the deuterium spikes seen near 485nm.
- **UV and Vis Light** - The optional F400YB fiber optic bundle cable is used to combine the SL1 halogen and SL3 to cover wavelength ranges from 190–2200nm.



SL3 spectrum using BLACK-Comet spectrometer

UV Light Source and Accessories

Item	Description	Price
SL3	Fiber optic deuterium light source	$1,495
SL3-CAL	With irradiance data diskette for 200-400nm	$1,745
F400-YB-SRNIR	400um fiber optic Y bundle cable	$250
Filter-U330	U330-Filter	$50
LENS-DCX	Lens DCX add-on for x7 optical gain	$100
SL3-spare bulb	Spare deuterium bulb - Hamamatsu L2D2	$450

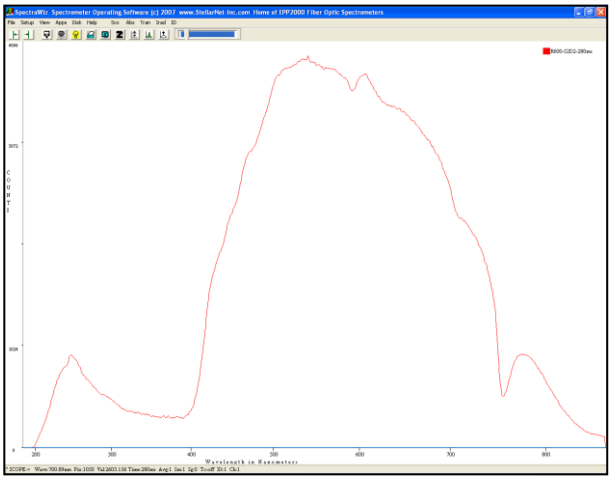
Specifications

Weight	1.8 pounds (816.5 g)	Output from bulb	free space into fiber optic
Power consumption	30 watts	Output regulation	0.05%
Spectral Range	190 – 450nm	Internal filter accessory	n/a
Time to stabilize output	15 min	External filter slot	holds 0.5 inch diameter filters
Power output	15 watts /m^2	Spectral attenuation	none
Bulb Color Temp	4000K	Connector	SMA905

SL4-DT Deuterium & Tungsten Light for UV-VIS-NIR

- **SL4-DT Light Source** is a miniature Deuterium and Tungsten-halogen light source that covers the 200-1700nm range in a single light source for spectroscopy measurements. Its high output power enables use for reflectance measurements, where other low power light sources like SL5 are too weak.
- **Miniature Size -** Small size of 72 mm x 40 mm x 90 mm makes it a perfect match for StellarNet miniature spectrometers such as the BLACK-Comet and BLUE-Wave series, and also the DUAL-DSR units for continuous 200-1700nm range. Special trifurcated reflectance probes enable high-sensitivity throughput over the entire range.

- **200-1700nm Spectral Range -** Combines two light sources into one small package with Deuterium bulb plus Tungsten-halogen bulb that has one SMA 905 fiber optic connection.
- **D-alpha line** (654nm) eliminated in deuterium source.
- **Dual Lamps –** Shutter button on the front panel blocks the light output of both lamps, necessary for taking dark reference spectrums without turning off the source.
- **Portability -** The combination of both lamps into one small enclosure reduces complexity and can be connected to the BP2 battery pack for field applications.



Relative intensity data of SL4-DT UV-VIS lamp.

Item	Description	Price
SL4-DT	High output Deuterium/Tungsten Lamp for UV-VIS	$ 2800
SL4-B-UV	Deuterium replacement bulb for UV	$ 595
SL4-B-VIS	Halogen replacement bulb for VIS	$ 295

Specifications			
Weight	200 grams	**Output to bulb**	Internal
Power consumption	10 VA	**Output fluctuation**	0.004 %p-p
Spectral Range	200-1700nm	**Deuterium bulb lifetime**	800 hours
Time to stabilize output	5 min	**Tungsten bulb lifetime**	1000 hours
Optical power in Watts/m^2	15 UV – 45 VIS	**Spectral attenuation**	450nm dip
VIS Bulb Color Temp	2800K	**Connector**	SMA 905

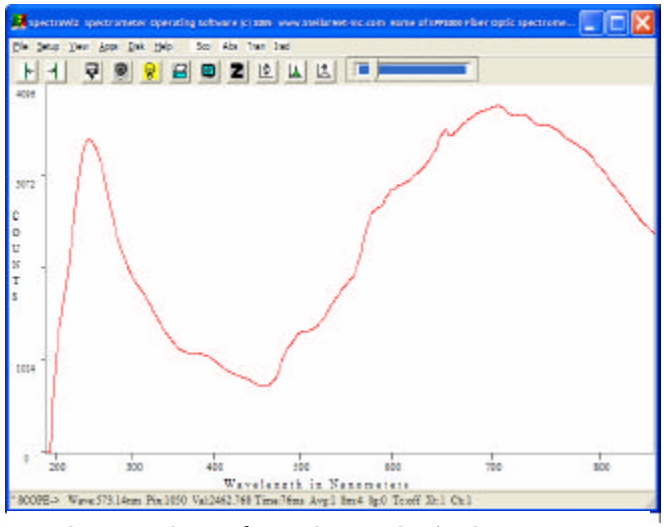
SL5 Deuterium Halogen Light Source for UV-VIS

SL5-CUV

SL5

- **190-1100nm Spectral Range -** Combines two light sources into one small package with deuterium bulb plus tungsten-halogen bulb in one fiber optic connection.
- **Miniature Size -** Its small size of 1.5 x 2.5 x 6" makes it a perfect match for our **BLUE-Wave** or **BLACK-Comet** spectrometers.
- **Dual Lamps -** The deuterium and halogen lamps can be individually turned on/off and have a front panel shutter control button for taking a quick dark spectra reference.
- **Portability -** The combination of both lamps into one small enclosure saves money and reduces complexity to provide the ultimate UV-VIS light source for portability.

- **The SL5 Deuterium Tungsten Halogen Light Source-** is a miniature Deuterium and halogen light source that covers the 190-1100nm range. The lamp combines the Deuterium Spectrum with the Tungsten Halogen spectrum to form a single optical path. The deuterium and halogen lamps can be individually turned on or off and have a front and rear panel shutter control. The SL5-DH lamp connects via fiber optic cable to cuvette holders, dip probes, and flow cells, with the return signal routed to the spectrometer via SMA 905 input connector.
- **SL5-CUV** adds an external cuvette holder that is ideal for transmission and absorbance measurements for liquids using standard 1cm UV grade cuvettes.
- **SL5-Filter** adds a nose cone to allow insertion of 0.5 inch diameter UV/VIS/NIR filters for special excitation applications. DCX lens option for x2 signal gain.



SL5 Lamp Spectra from a Concave Grating Spectrometer

SL5 Light Source and Accessories

Item	Description	Price
SL5	SL5 Deuterium / Tungsten UV/Vis/NIR Lamp	$1,250
SL5-CUV	SL5 with Cuvette Holder	$1,500
SL5-FILTER	SL5 with Filter Holder	$1,500
LENS-DCX	Lens DCX add-on for 2x gain (SL5-FILTER only)	$100

Please note the SL5 cannot be used with a reflectance probe as it has low signal power. >>See the SL3 deuterium or SL4 deuterium plus halogen light sources.

Specifications

Weight	1 pound (454 g)	**Output to bulb**	Internal
Power consumption	6 Watts	**Output regulation**	0.05%
Spectral Range	190-1100nm	**External filter accessory**	Demountable
Time to stabilize output	5 min	**External filter slot**	0.5” diameter filters
Power output	1 W/m^2	**Spectral attenuation**	450nm dip
Bulb Color Temp	3000K	**Connector**	SMA 905

Fiber Optic Cables for UV-VIS-NIR

- **Single strand, multimode fiber optic cables** are available with SMA905 connectors, ¼ inch dia. steel mono-coil armor with black PVC jacket. Sizes include 400, 600, or 1000µm core diameters
- **Standard lengths** are 1 and 2 meters
- **Custom lengths** are available with a minimum price of a 1 meter fiber (extra delivery time also)
- **Solarization resistant** fibers available for deep UV applications below 300nm in all diameters
- **High OH fibers (190-850 nm)** are needed for UV and UV-VIS applications below 400nm
- **Low OH fibers (400-2200 nm)** are needed for VIS-NIR applications. They offer lowest possible internal light attenuation. Intended for applications with long fiber lengths.
- **Specialty fibers for various applications**
  - Y-cables to couple 2 spectrometer systems
  - Y-bundled cables to couple 2 light sources
  - 1 to 3 splitter cable
  - Custom fibers to meet your application

Armored Fiber Optic Cable Splitter 1-TO-3

400 µm Fibers

Item	Description	Price
F400-UVVis-SR	Armored, 2 meters, Solarization Resistant fiber optic cable	$145
F400-VISNIR	Armored, 2 meters, fiber optic cable	$115
F400-per meter	Price per additional meter, armored with black PVC jacket	$40
F400YBNIRUVSR	Y-cable bundle, 0.5 meter, 4 SR & 3 NIR fibers connects SL1+SL3 lamps	$380

600 µm Fibers

Item	Description	Price
F600-UVVis-SR	Armored, 2 meters, Solarization Resistant fiber optic cable	$190
F600-VisNIR	Armored, 2 meters, fiber optic cable	$140
F600-per meter	Price per additional meter, armored with black PVC jacket	$90
F600-Y-VISNIR	Armored Y cable, 1 meter, 1 SMA to 2 SMA, all for NIR	$280
F600-Y-UVSRNIR	Armored Y cable, 1 meter, 1 SMA to 2 SMA, SR+NIR	$380
F600-1TO3-SR	Armored splitter, 1 meter, 1 SMA to 3 SMA, all Solarization Resistant	$365

1000 µm Fibers

Item	Description	Price
F1000-UVVis-SR-1	Armored, 1 meter, 1000um, Solarization Resistant fiber optic cable	$170
F1000-VISNIR-1	Armored, 1 meter, 1000um fiber optic cable	$160
F1000-per meter	Price per additional meter, armored with black PVC jacket	$150

Specifications			
Weight	Varies on length/diameter	**Fiber material**	Silica core - silica clad
Length	1 – 2 meter, or custom	**Diameter**	400 µm or 600 um or 1000 µm
Spectral range	190 – 2200nm	**Connectors**	SMA 905
Numerical aperture	0.22 NA	**Temperature range**	0 – 50 Deg C

Reflectance Probes for UV-VIS-NIR

- **The Reflectance Probe** has 6 illuminating fibers and 1 read fiber bundled together using 400 micron fibers. As an option, the 2R probe has 5 illuminating fibers and 2 read fibers. All fibers are 400µm.
- **Increased sensitivity** using a 7 around 1 design and increasing the fiber diameter to 600 micron. This allows up to **3x** the signal gain than the 6:1 probe.
- **The RPH1 Reflectance Probe Holder** sets the probe at a 45 degree angle and a set distance from the sample.
- **Typical applications** include color CIELAB measurements of solid samples configured for diffuse reflectance using the RPH1.
- **Specular measurements** can be taken using the RPH2 and RPH3 probe holders which holds the probe at a 90° angel, with a locking set screw to maintain constant distance.

- **190 nm-2200nm Spectral Range-** effective for color of solids and reflectance measurements
- **The RS50** is a 50mm diameter white reflectance standard made of Halon. It is used to take reference measurements using the R400 Reflectance Probe. The white standard will reflect >97% of the light from 300-1700nm.
- **Simple to use Design-** easy to attach light source and spectrometer via integrated 400um fiber optic cable
- **Consistent Measurements-** using the RPH1 reflectance probe holder, users can get reproducible results time after time.

Fiber Optic Probe Accessories

Item	Description	Price
R400-7-UVVIS	Reflectance Probe for UV and Visible; 6 around 1 with 400µm fibers	$495
R400-7-VISNIR	Reflectance Probe for Visible and Near IR; 6 around 1 with 400µm fibers	$395
R600-8-UVVIS-SR	Reflectance Probe for UV and Visible; 7 around 1 with 600µm fibers	$595
R600-8-VisNIR	Reflectance Probe for Visible and Near IR; 7 around 1 with 600µm fibers	$495
RPH1	Reflectance Probe Holder block for 45° angle measurements	$65
RPH2	Reflectance Probe Holder block for 90° angle measurements	$125
RPH3	Reflectance Probe Holder stand for 90° angle measurements	$275
RS50	White Reflectance Standard	$125
RTIP45	45° angled tip for Reflectance probes; includes locking screw for positioning	$125

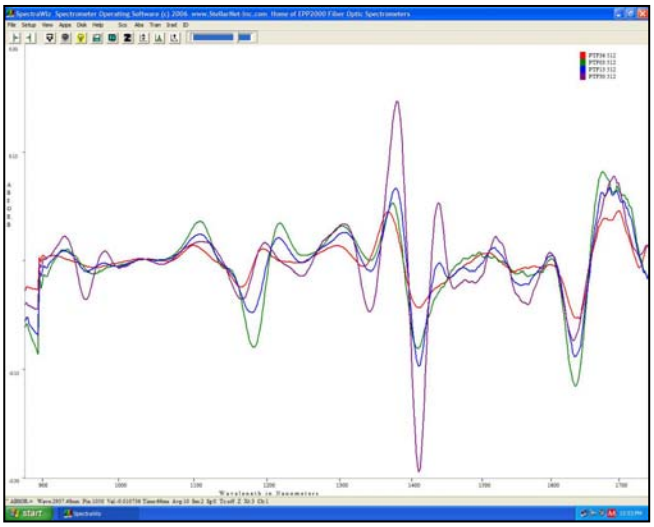
Specifications

Weight	**0.22 pounds (100g)**	**Probe Tip Material**	Stainless Steel
Size (Probe)	**3.5" length 0.25" O.D.**	**Number of Fibers**	6:1, 7:1, or 2 read fibers
Spectral range	**190 – 2200nm**	**Connector**	2 x SMA 905

RFX Reflectance Fixtures for VIS-NIR

- **350 nm-2200 nm spectral range-** measurements include reflectance and absorbance for VIS color measurements, NIR spectral signatures for material identification and chemical concentrations.
- **Flexibility-** can be used as a stand, or a portable handheld device for on-the-go measurements. Lightweight, 2-piece construction allows for easy storage and portability.
- **Includes** UP12V universal power adapter.
- **Battery-pack option available.**

- **RFX-1** VIS-NIR reflectance fixture with integrated 10 watt halogen bulb. Collimating lens reduces sample spot size to 5mm and feeds the SMA-905 fiber optic interface to the spectrometer.
- **RFX-2** VIS-NIR reflectance fixture with integrated 10,000 hour 5 watt halogen bulb. No collimating lens increases sample spot size to 20mm for the SMA-905 fiber optic interface to the spectrometer. Ideal for delta-E* color measurements. Ultimate stability achieved with 2 stage bulb power supply.
- **Effortless solids measurement** for samples such as plastics and textiles, by placing the sample directly on the stand's surface.
- **Liquids and powders** can easily be measure by placing the sample in a Petri dish or sample jar.



2nd Derivative spectra of Ready to Eat Food (samples provided by USDA)

Fiber Optic Accessory

Item	Description	Price
RFX-1	Reflectance Fixture	$295
RFX-2	Reflectance Fixture for Color Measurements	$495
F600-VIS-NIR-2	2 meter Fiber optic cable for RFX-1 (required)	$140
F1000-VIS-NIR-1	1 meter Fiber optic cable for RFX-2 (required)	$160

Specifications

Weight	3.2 pounds (1452 g)	**Fiber Options**	1000 micron
Size	5" x 5-¼" ø top x 3-½" ø bottom	**Sample port**	1-¼" diameter
Spectral range	350 nm – 2200 nm	**Connector**	SMA 905

Adjustable Reflectance & Transmission Fixtures

- **The RPH-3 Reflectance probe holder** includes a single stage to hold reflectance probes (R400 or R600) in the 90° angle for specular measurements.
- **Precision alignment** using two locking screws to adjust the probe height. Rough course and fine adjustment enable reliable and consistent measurements.
- **The RPH-3** is ideal for Thin Film measurements or highly reflective surfaces such as mirrors or metallic samples.

- **The TXF-4** includes two collimating lenses which allows the sample to be oriented vertically as shown above.
- **190 nm-2200nm Spectral Range** for transmission measurements of liquids, solids, and gases
- **Ultimate Flexibility-** standard fixture allows a variable pathlength from 0 to 7cm
- **Interchangeable parts** allow the TXF-4 to be easily converted into the RPH-3using the same base and stand.

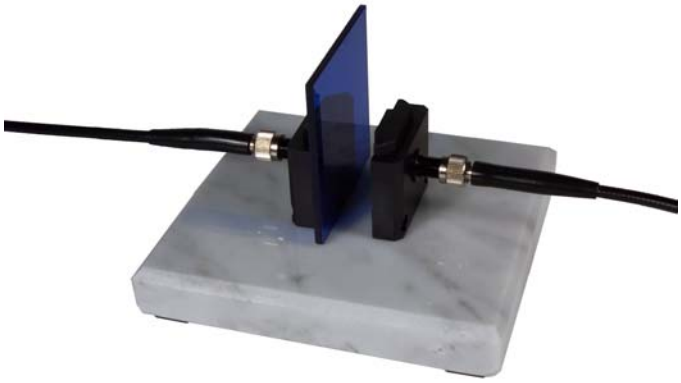
Adjustable Reflectance and Transmission Fixtures

Item	Description	Price
RPH-3	Vertical reflectance probe holder stand for 90° (specular) measurements	$275
TXF-4	Vertical Transmission Fixture with 2 collimating lenses (LENS-QCOL)	$495
RPH-3K	Horizontal bar with probe mount lock -adds to TXF-4 for use as RPH-3	$100
TXF-4K	Horizontal plates with 2 LENS-QCOL -adds to RPH-3 for use as TXF-4	$275

Specifications

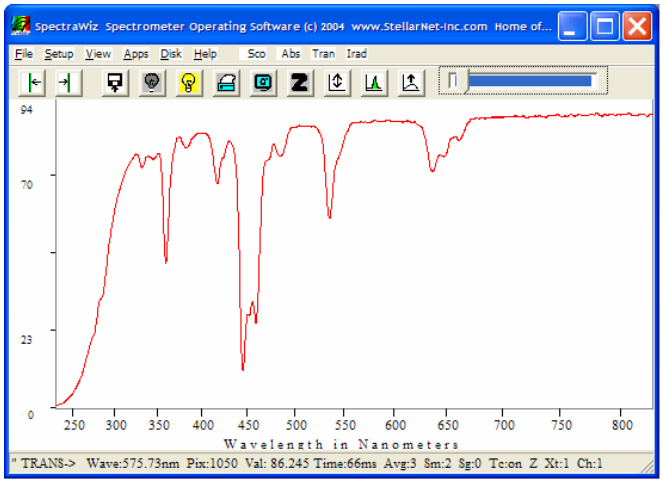
Weight	2.2 pounds (1.0 kg)	**TXF-4 Fiber Options**	400, 600, or 1000 micron
Size	6" x 6" x 6"	**Pathlengths**	Variable from 0 to 7cm or more
Spectral range	190 – 2200nm	**Connectors**	SMA 905

TXF1 Transmission Fixture for UV-VIS - NIR



- **190 nm-2200nm Spectral Range-** transmission or absorbance measurements of liquids, solids, and gases
- **Flexibility-** a fixed 1cm open pathlength allows samples to be inserted between the illuminating and read fibers
- **Designed for simple use-** easy to attach fiber optic cables to connect light source and spectrometer. Two integrated collimating lenses send and receive light across the 1cm path for transmission measurements
- **Sturdy base-** made of marble, easily holds the text fixture in place

- **The Transmission Fixture** includes 2 UV grade collimating lenses, aligned and fixed 1cm apart.
- **Liquid measurements** can easily be done with a standard 1cm cuvette or flow cell. Measure light absorbance and transmission.
- **Solid samples** such as filters and other types of optics can be easily slid into the light path for transmission measurements. With open sides, large samples can be accommodated.
- **Gas analysis** is easily done by measuring the atmospheric gas or by inserting a gas cell.



Transmission of Holmium Oxide Glass

Fiber Optic Accessory

Item	Description	Price
TXF1	Transmission Fixture	$450

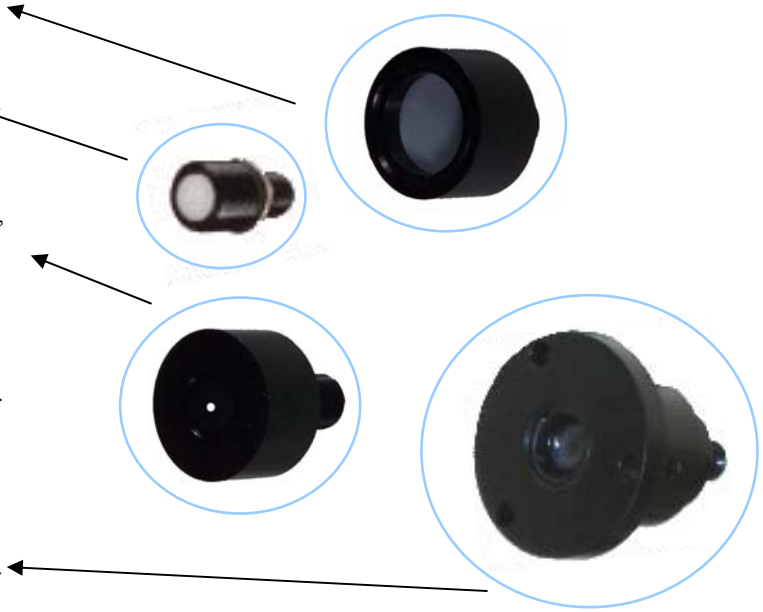
Specifications

Weight	1.0 pounds (454g)	**Fiber Options**	200, 400, 600, or 1000 micron
Size	3.75” x 4” x 1.25”	**Pathlength**	10 mm
Spectral range	190 – 2200nm	**Connectors**	2 x SMA 905

Cosine Receptors for SpectroRadiometry

- **Cosine Receptors** collect light with an 180° field of view using demountable diffusers with ~10% loss. A perfect cosine response provides accurate absolute intensity when multiple lights are measured at same time.
- **Fiber-Less** adapter eliminates the need for fiber optics by enabling cosine receptors to be connected directly to the spectrometer using the SMA-Coupler.
- **Irradiance Calibrations** are performed using NIST traceable light sources for 200-400nm and 300-1700nm.
- **Applications** include laser & light source characterization and varieties of UV light emission, LED color and spectral intensity, solar irradiance measurements, and a variety of light measurement in the field including under water.

- **CR1-UVN** is a ½" diameter **near** cosine receptor using sanded fused silica diffuser for 200-1700nm. Has reduced 90° FOV and low 7% loss.
- **CR2** is a ¼" diameter UV-NIR cosine receptor using a polymer diffuser for 200-1100nm & 180° FOV.
- **CR2-AP** is a 10% aperture for the CR2 that extends the system dynamic range by an order of magnitude, thus enabling spectral measurements of sources that are 10 times brighter without the need for re-calibration using a brighter IRRAD-CAL lamp.
- **CR2-RA** is a 90° right-angle Cosine Receptor cube.
- **CR1-TP or CR2-TP** miniature tripods for the CR1-UVN or CR2.
- **CR-LENS** is a cosine receptor lens assembly that reduces the field of view from 180 degrees to a small spot. Adjustable focus allows variable distance from target surface such as OLED displays.



SpectroRadiometry Accessories

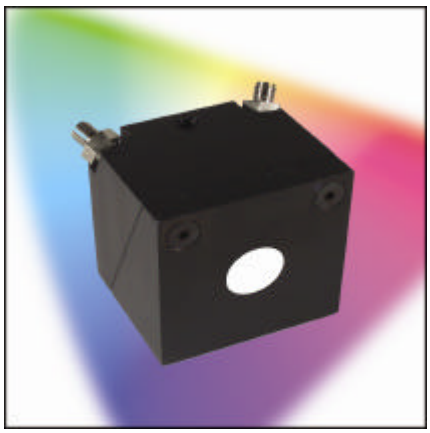
Item	Description	Price
CR1-UVN	Near Cosine Receptor, 0.25" diameter	$115
CR1-TP or CR2-TP	Tripod for CR1-UVN, CR2, IC2, or IC6	$50
CR2	Cosine Receptor, UV-Vis-NIR	$125
CR2-AP	Aperture for CR2, screw on attachment	$125
CR2-RA	Cosine Receptor at 90° right angle	$375
CR-LENS	Focus measurement to small spots on displays	$250
SMA-Coupler	Fiber-less cosine receptor attachment	$35

Specifications

	CR1	CR1-UVN	CR2	CR2-RA
Wavelength	300-1100nm	190-1700nm	200-1100 nm	200-1100 nm
Diameter	½ inches	½ inches	¼ inches	¼ inches
Field of View	180°	90°	180°	180°

Low Cost Integrating Spheres

StellarSpheres are spectroradiometrically calibrated integrating spheres, designed specifically for low cost measurement of light (LEDs/Solar/UV-VIS-NIR). StellarNet integrating spheres are combined with miniature spectrometers to provide absolute intensity measurements that are NIST traceable. Measurements include **Radiant/Luminous Flux (Watts/Lumens), also Watts/m^2 and Lumens/m^2, 1931 xy-chromaticity (color) Correlated Color Temperature (CCT), Color Rendering Index (CRI), Dominant Wavelength, Purity** and much more! Applications include LED characterization over time/temperature for industrial lighting design R&D - QA/QC, development of products for Solar cells, Laser, grow Lamps, Neon, any type of light emission!

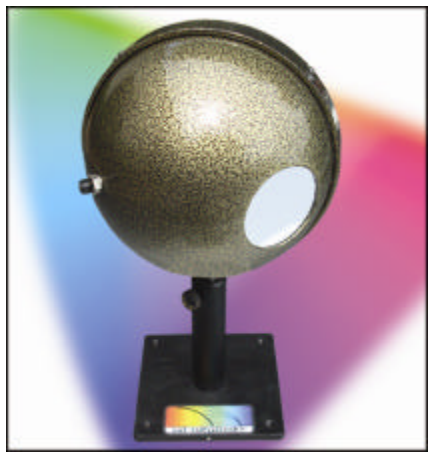


The **StellarSphere IC2** is a 2” cube with internal integrating sphere. It has a 5/8” input port, internal reflective coating, and SMA fiber optic output. The additional SMA input can be used for reflectance illumination.

Technical Specifications	IC2
Weight	0.45 pounds
Sphere diameter	2 inches
Field of View	180^o
Wavelength Range	200-1700nm

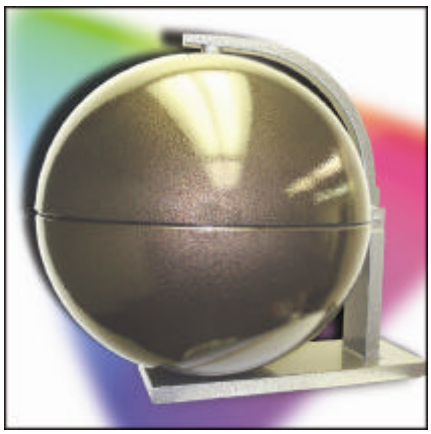
➢ **$495**

The **StellarSphere IS6** is a 6” diameter integrating sphere with a 2” input port, internal reflective coating, baffle system, and SMA fiber optic output. Great for high intensity light level applications, LED arrays and much more.



Technical Specifications	IS6
Weight	1.5 pounds
Sphere diameter	6 inches
Field of View	180^o
Wavelength Range	200-1700nm

➢ **$1745**



The **StellarSphere IS12** is a 12” integrating sphere that opens to allows for simple internal mounting of devices for light measurement such as discrete LEDs, arrays, and more. A tungsten halogen bulb and data file are included for system calibration using the SpectraWiz® radiometer software.

Technical Specifications	IS12
Weight	5 pounds
Sphere diameter	12 inches
Wavelength Range	300-1100nm

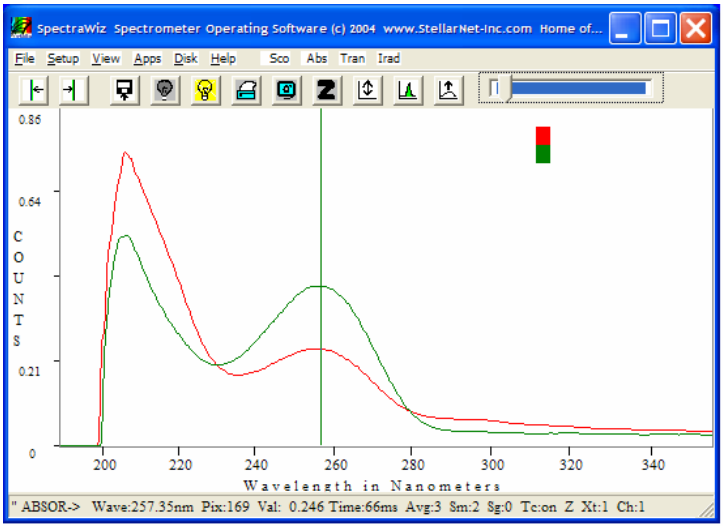
➢ **$3495**

StellarNet Inc
14390 Carlson Circle
Tampa, Florida, 33626 USA
Voice: +1-813-855-8687
Fax: +1-813-855-0394
www.StellarNet.us
ContactUs@StellarNet.us

CUV1 Fiber Optic Cuvette Holder for UV-VIS - NIR

- **190 nm-2200nm Spectral Range-** effective for color, transmission and absorbance measurements
- **Standard 1 cm pathlength-** holds 1 cm plastic, glass, and quartz cuvettes
- **Fluorescence measurements-** using the 90 degree pickup port and the black anodized cover (not shown)
- **Flexible design-** can use up to 4 fiber optic ports or a low cost option with only 2 collimators

- **The CUV1** is used for transmission, absorbance, fluorescence, and color measurements in liquids. Includes 2 UV grade collimating lenses.
- **The CUV2** is the same as the CUV1 but we've added another collimating lens.
- **Typical applications** include concentration measurements, color CIELAB measurements, kinetics studies, enzymatic reactions, spectral identification, and much more.
- **Recommended spectrometer** for UV-Vis measurements are: EPP2000C concave grating spectrometer 190-850nm or UVN-SR composite grating spectrometer 200-1100nm. Also works with the SL5 Deuterium + Halogen light source.



Spectra of an Agricultural Chemical using a 1 cm cuvette

Fiber Optic Accessories

Item	Description	Price
CUV1	Cuvette Holder with 2 LENS-QCOL	$450
CUV2	Cuvette Holder with 3 LENS-QCOL	$595
LENS-COL	Collimating Lens	$135
LENS-QCOL	Collimating UV Lens	$145

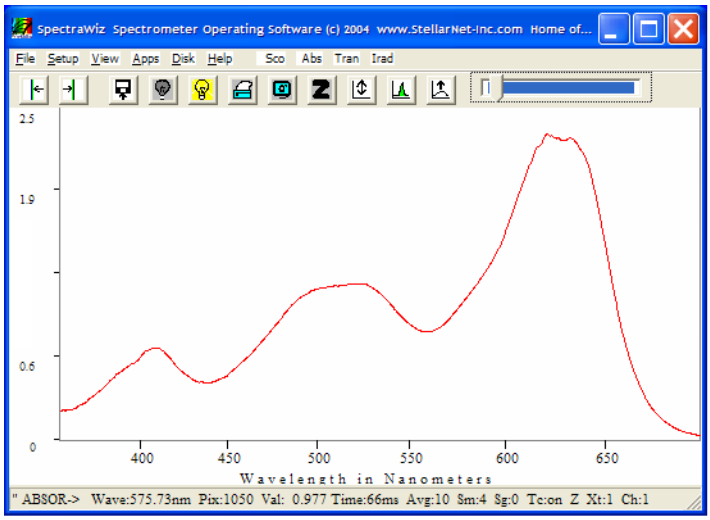
Specifications

Weight	1.1 pounds (500 g)	**Pathlength**	1 cm
Size	4" x 4" x 2.5"	**Z height**	15 mm
Spectral range	190 – 2200nm	**Connector**	SMA 905

Transmission Dip Probe for UV-VIS-NIR

- **Large Spectral Range [190 nm-2200nm]**
- **Enhanced Design** includes an integrated mode stripper which enables the end-user to move the probe after a reference has been taken.
- **Variable Pathlength Design** enables the end-user to adjust the optical pathlength of the measurement [2, 5, 10, and 20 mm pathlengths are available].

- **The Dip Probe** connects to a light source and a spectrometer to measure characteristics of liquid samples.
- **The Dip Probe Tip** fixes the light path for consistent absorbance / transmission measurements, and is easily changed to shorter or longer path tips to measure lower or higher concentrations.
- **Typical applications** include color measurements, chemical concentrations, process monitoring, and environmental chemistries.
- **Special mode mixer** stabilizes fiber optic cable movements needed for low level measurements.



Absorbance Spectra of a Colored Dye using a DP400 Dip Probe inserted into a beaker

Fiber Optic Accessories

Item	Description	Price
DP400-UVVIS-SR	Dip Probe for UV-Vis - solarization resistant	$1595
DP400-VISNIR	Dip Probe for Vis-NIR	$1595
DP-TIP-XX	Dip Probe Tips, specify 2, 5, 10 or 20 mm	$410

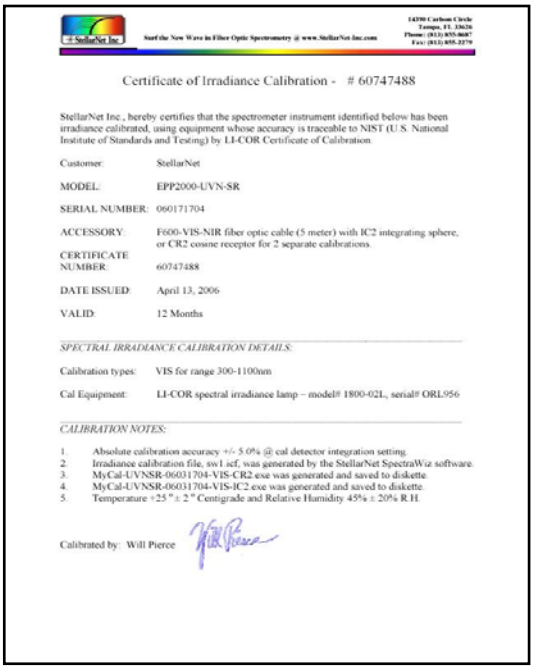
Specifications

Weight	0.22 pounds (100g)	**Probe Tip Material**	Stainless Steel
Size (Probe)	5.5" length 0.25" O.D.	**Pathlengths**	2, 5, 10, or 20 mm
Spectral range	190 – 2200nm	**Connectors**	2 x SMA 905

Spectral Calibrations for UV-VIS-NIR

- **NIST traceable** Irradiance calibration service
- **Allows absolute intensity** measurements using Irradiance Compensation File (ICF) generated by calibration. To enable, install MyCalnnnnn.exe.
- **Absolute calibration** accuracy within 10% at detector integration setting used for calibration.
- **Measure radiance** in watts/nm and lumen/nm (see RAD-CAL option below), and **irradiance** in watts/m^2, microwatts/cm^2, lumens/m^2, LUX, moles per second, PAR, Footcandles, Radiant Flux, Luminous Flux, xy Chromaticity, color correlated temperature (CCT), CRI and CQS, +more.
- **Fast turn around:** most systems can be calibrated within 1.5 weeks after receipt of order. Quick CAL service options available.
- **Can be calibrated** with fiber optic accessories:
- **Integrating Sphere** such as IC2 or **cosine receptor** such as or CR2-UV-VIS-NIR, or user supplied.
- **F600um fiber optic cable** for 50um slit or larger
- **F1000um fiber optic cable** for 25um slit
- **Cosine Receptors** can be direct attach no fiber

- **Optional IRRAD-CAL Certificate**



Certificate of Irradiance Calibration - # 60747488

StellarNet Inc., hereby certifies that the spectrometer instrument identified below has been irradiance calibrated, using equipment whose accuracy is traceable to NIST (U.S. National Institute of Standards and Testing) by LI-COR Certificate of Calibration.

Customer:	StellarNet
MODEL:	EPP2000-UVN-SR
SERIAL NUMBER:	060171704
ACCESSORY:	F600-VIS-NIR fiber optic cable (5 meter) with IC2 integrating sphere, or CR2 cosine receptor for 2 separate calibrations.
CERTIFICATE NUMBER:	60747488
DATE ISSUED:	April 13, 2006
VALID:	12 Months

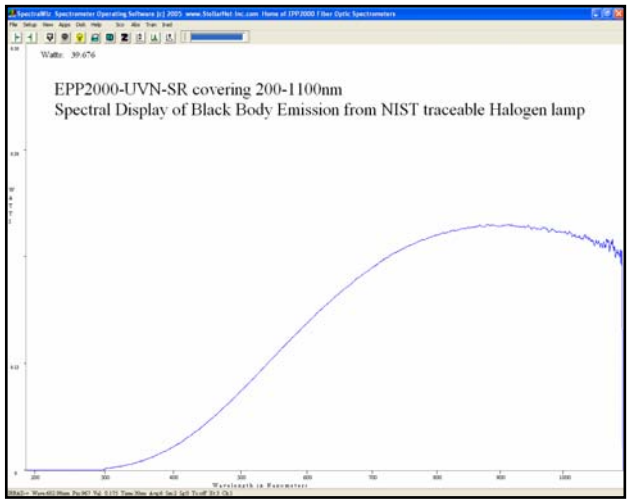
SPECTRAL IRRADIANCE CALIBRATION DETAILS:

Calibration types:	VIS for range 300-1100nm
Cal Equipment:	LI-COR spectral irradiance lamp – model# 1800-02L, serial# ORL956

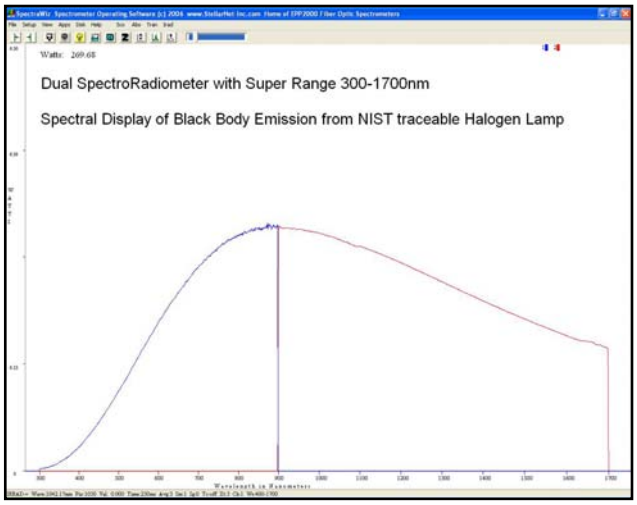
CALIBRATION NOTES:

1. Absolute calibration accuracy +/- 5.0% @ cal detector integration setting.
2. Irradiance calibration file, sw1.icf, was generated by the StellarNet SpectraWiz software.
3. MyCal-UVNSR-06031704-VIS-CR2.exe was generated and saved to diskette.
4. MyCal-UVNSR-06031704-VIS-IC2.exe was generated and saved to diskette.
5. Temperature +25 °± 2 ° Centigrade and Relative Humidity 45% ± 20% R.H.

Calibrated by: Will Pierce



UVN-SR Spectrometer 200-1100nm



Dual DSR Spectrometer 280-1700nm

Item	Description	Price
IRRAD-CAL	VIS-NIR for range 300-1100nm Note: actual spectrometer range can be smaller	$250
IRRAD-CAL-NIR	NIR for range 900-1700nm Note: actual spectrometer range can be smaller	$250
IRRAD-CAL-UV	UV for range 200-600nm Note: actual spectrometer range can be larger	$250
IRRADCAL-UVN	UV-VIS for range 200-850nm Concave grating only, dual UV+VIS calibration	$500
RAD-CAL	*RADiant power cal in Watts/nm for spheres for laser & LED (Lumens/nm)	$250
RAD-CAL-SR	*RADiance cal in Watts/sr/m^2 for Candela (Cd/m^2/nm) - requires CR2-LENS	$250
IRRAD-CAL-DOC	**Optional CAL certificate documents equipment and NIST traceable numbers	$125

* 300-1100nm only **Document must be ordered at the time of calibration

BP1/2 Battery Pack for Spectrometers & Light Sources

BP1 Battery Pack has two +5VDC

- **Ultimate Portability** using the light weight BP1/BP2 battery pack for field work.
- **Long Life** rechargeable battery pack BP1 provides over 5 hours of continuous spectral acquisition for NIR-InGaAs spectrometer with TEC or 20 hours with TEC off or when using other spectrometer models.
- **Extends the Battery Life of any Portable Computer** and improves the overall signal-to-noise ratio of the spectral measurement as compared to powering the spectrometer from the laptop's USB port.

- **Light Weight (1 lb) Lithium-Ion** battery pack can power any StellarNet spectrometer, including the TEC cooled InGaAs spectrometer.
- **5400 & 7400mA Hour** battery that is rechargeable using the included universal AC adapter.
- **A High Precision DC Regulator** supplies a constant 5 volt power output throughout the battery live cycle; which is critical for long-term spectral measurements ***and saves your notebook power***.
- **Dual Outputs** allows the user to run two (2) spectrometers simultaneously or a single (1) spectrometer and a light source that has been upgraded with a 5V power option [SL1-BAT].
- **BP2** has 2 additional power outputs to operate our 12VDC light sources. This includes SL1 (halogen or LED), SL4/ SL5 deuterium+halogen sources.

BP2 Battery Pack, (2) +5VDC & (2) +12VDC

Battery Packs and Accessories

Item	Description	Price
BP1	Battery Pack, Lithium-Ion, 5400mA/h, 2 x 5V out	$399
BP2	Battery Pack, Lithium-Ion, 7400mA/h, 2 x 5V & 2 x 12V out	$795
SL1-BAT	Upgrade for SL1 to accept 5V from BP1	$50

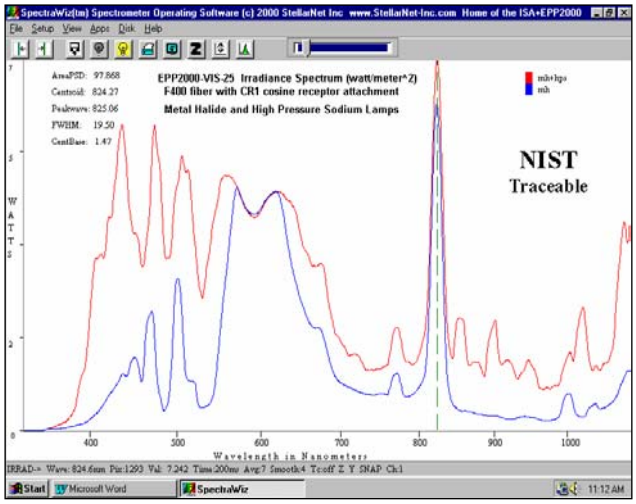
Specifications

	BP1	BP2
Weight	1.0 pounds (454g)	2.5 pounds (1134g)
Size	6.25" x 3.75" x 1.75"	7.5" x 4" x 1"
Charge Voltage	+12 VDC input	+12 VDC input
Outputs	2 x +5VDC	2 x +5VDC & 2 x +12VDC
Battery Life @1 amp	5.4 hours	7.4 hours
Charge Time	Approx. 2 hours	Approx. 3 hours

www.StellarNet-Inc.com

Analytical Instrumentation

Surf the New Wave in Portable Fiber Optic Spectrometry

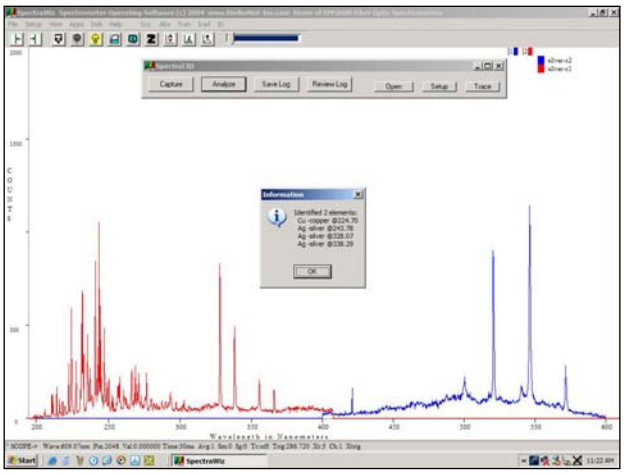


SpectraWiz® Software Features:

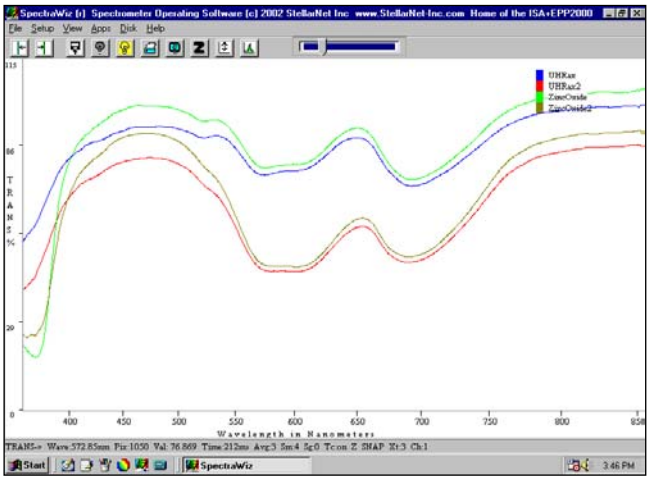
- ✓ Real-time Spectral Graphing and Instrument control with Data Save and Multi-File Plot
- ✓ Measure Spectral Absorbance, Transmittance, reflectance, Irradiance, Fluorescence & Emissions
- ✓ SpectroRadiometer App Measures Absolute Intensity Watts, Lux, and Color Temp & xy Chromaticity
- ✓ SpectroColorimeter App Measures CIELAB Color L* a* b* and Delta E* Color Differences in Real-time
- ✓ ChemWiz® Measures Concentrations via Methods

The SpectraWiz® operating software for Win9x/NT/00/XP is included free with each StellarNet miniature fiber optic spectrometer system. SpectraWiz has powerful applications and tools to interpret and measure your spectral data for real-time spectroscopy.

The **SpectroRadiometer** application measures irradiant intensity in watts per meter^2, and moles per second (a photon dose rate) with integral PAR value (Photo-synthetic Active Radiation). Illuminance can also be measured in photometric units of lumen per meter^2 per nm with an integrated value displayed for total LUX. Also ft. candles, radiant, & luminous flux.



Transmittance and **reflectance** can be used to characterize fluids, gasses, and optical materials. Light reflectance from solids and transmittance in fluids is also used to provide colorimetric information. The **SpectroColorimeter** app converts the spectral data to **CIELAB color** values **L* a* b*** for both solid and liquid samples. Color differences between a sample and a pre-saved color standard are easily measured using the CIELAB **Delta E*** value indicator.



With multi-channel displays and toolbar functions, **emission** measurements of peak, centroid, and FWHM wavelengths can be easily made for plasma, laser, and light emitting diodes. Measure area of **fluorescence** emitted by chemical reagents, UV/laser induced spectroscopy, and fiber optic chemical sensors. The **ChemWiz** app measures sample concentrations using **absorbance** according to Beer's law for a specific path length. User configurable methods specify instrument setup and calibration parameters.

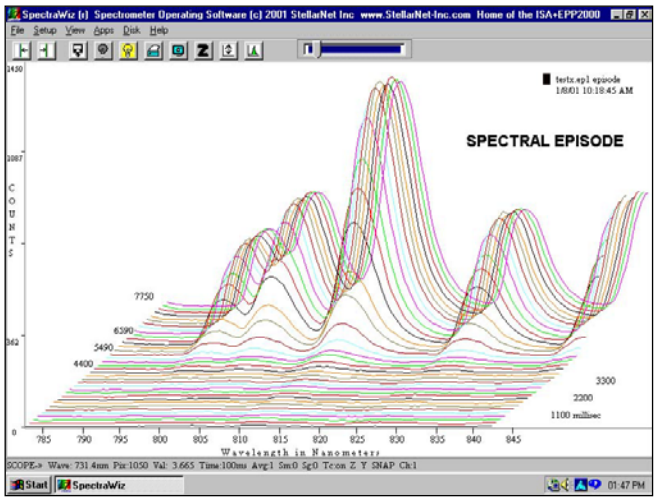
StellarNet Inc
14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

www.StellarNet-Inc.com

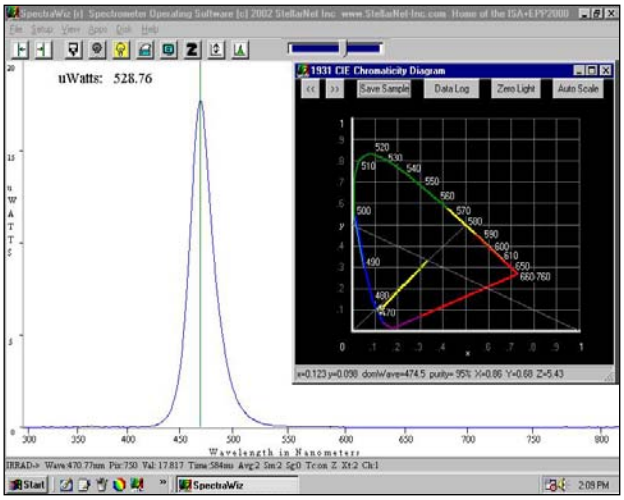
Analytical Instrumentation

Surf the New Wave in Portable Fiber Optic Spectrometry

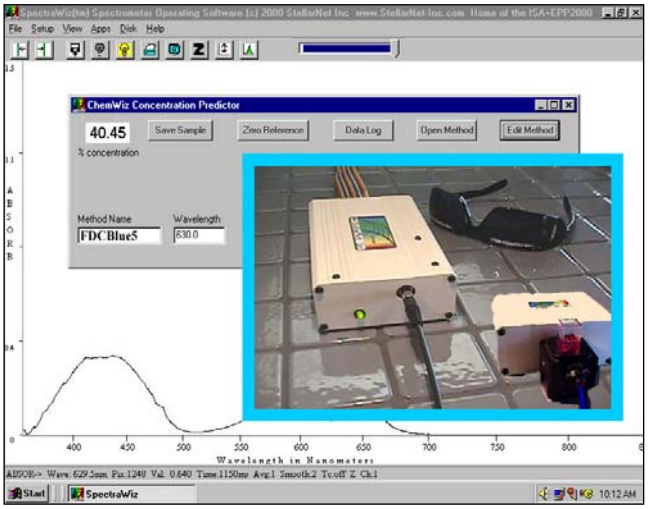
The SpectraWiz® operating software for Win9x/NT/00/XP is included **Free** with each StellarNet miniature fiber optic spectrometer system. SpectraWiz has **powerful applications and tools** to interpret and measure your spectral data and perform real-time spectroscopy.



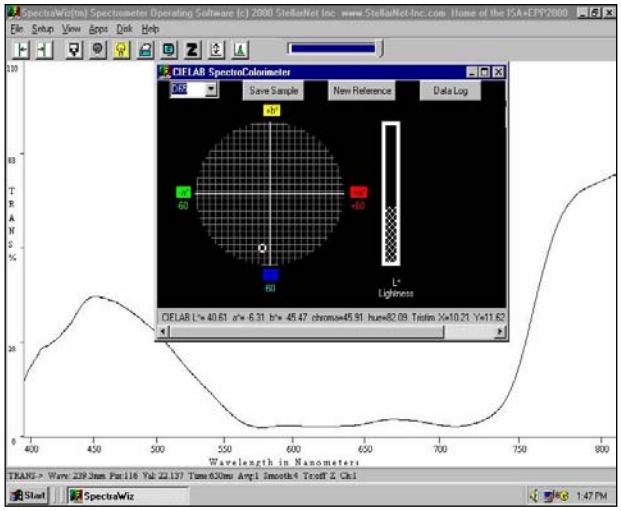
Spectral Time Series Analysis
Via Episodic Capture



SpectroRadiometry & LED xy Chromaticity
& Correlated Color Temperature (CCT)



ChemWiz Concentration Display
Via Integrated PLS Calibration



CIELAB SpectroColorimetry
L* a* b* plus Delta E*

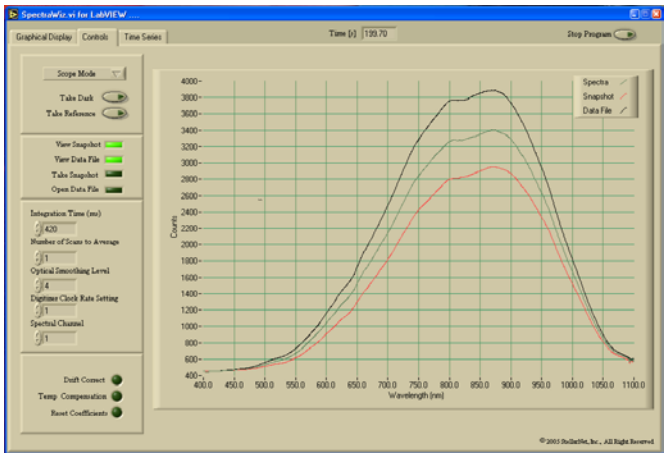
Spectroscopy measurement applications are **integrated into a single program** to measure absorbance AU, %T, Concentrations, Reflectance, Colors, Fluorescence, Emissions, Absolute Intensities (watts, lumens, lux, moles), **LED** & Light xy Chromaticity, **CCT**, **UVabc emission monitor** (not shown). Optical Trigger, Graphing, Time series, and **Multi-Channel features**. SpectraWiz software also includes customizable programs for operation with **LabView**, **Excel** + **VBA** (Visual Basic Automation), **Delphi** Pascal, and Visual **C.**

StellarNet Inc

14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-2279**

www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

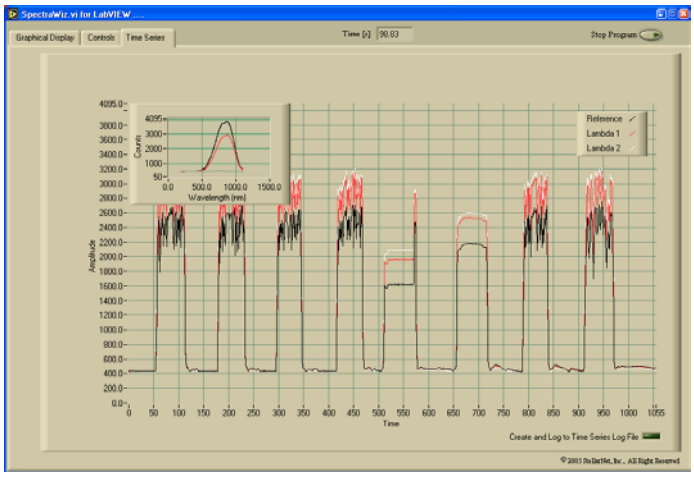
SpectraWiz® Spectroscopy Software for LabVIEW™



A fully operational, user configurable, Spectroscopy Suite for LabVIEW enables the user to rapidly prototype any application.

LabVIEW Software Features:

- ✓ **Real-time Spectral Graphing & Instrument control with File Save, File Open, and Multi-Spectra Plotting**
- ✓ **Measure Spectral Absorbance, Transmittance, Reflectance, & Irradiance**
- ✓ **SpectroRadiometer Application Measures Absolute Intensity in Watts**
- ✓ **Time Series Analysis Enables Calculation of Kinetic Parameters**
- ✓ **Single Beam Spectroscopy using Relative & Absolute Drift Correction**
- ✓ **User Configurable for Custom Application development**



Shown above is a screen shot of the LabVIEW time series graph in an application that analyses grain patters in wood. In set in the upper left-hand corner is a graphic that shows the spectral reflectance data, and the main graphic shows the spectral response to grain differences at three wavelengths as a pieces of Oak passes the sensor.

The **SpectraWiz® for LabVIEW™** operating software for Win9x/NT/00/XP is included free with each StellarNet miniature fiber optic spectrometer system.

The LabVIEW programming environment allows rapid customization to adapt the software to any application.

Current features included in StellarNet's Spectroscopy Suite for LabVIEW include real –time setting of all instrument confiburation parameters, plotting of spectral data in Scope mode, Absorbance mode, Transmission mode, and even Irradiance mode. In addition, a time series function is built in that enables the user to select three independent wavelengths and follow them as a function of time. This time series data can be exported to file and post-processed for kinetic parameters. In addition to the Spectroscopy Suite, basic Vis are available that will allow the user to integrate StellarNet's spectrometer into their existing LabVIEW application.

The SpectroRadiometer application measures absolute irradiance in watts/meter^2/nm. Here the user can measure the Power Spectral Density (PSD). This is the integrated area under the spectral curve bounded by a specified wavelength range. Additionally, an optional Dynamic Link Library is available for use in the SpectroRadiometer mode that enables LabVIEW to calculate the 1931 xy chromaticity coordinates of sources such as LEDs, for precise color measurements.

www.StellarNet-Inc.com

Analytical Instrumentation

Surf the New Wave in Portable Fiber Optic Spectrometry

SpectraWiz® Spectroscopy Software for Microsoft Excel:

SpectraWiz® for Excel Window is included with each StellarNet miniature fiber optic spectrometer system. This Excel Project enables not only spectral measurement but also full control (i.e. configuration) of your StellarNet spectrometer from the Microsoft Office environment.

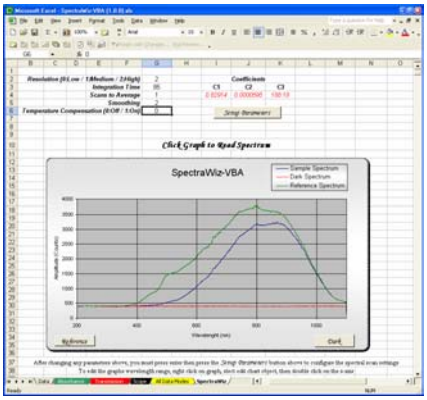
Software Features:

- ✓ **Real-time Spectral Graphing and Integrated Instrument Control**
- ✓ **Automatically Calculates Spectral absorbance & % Transmittance**
- ✓ **Automatically Graphs both the Raw spectral Data & Processed Data**
- ✓ **Capable of Multi-Channel Data acquisition with multiple spectrometers**
- ✓ **Measure CRI & CQS (avail on request)**

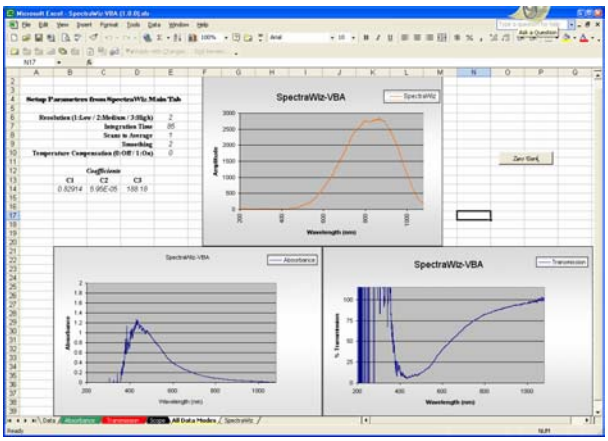
With our VBA modules, you can rapidly customize your spectral analysis to meet your unique research requirements. For example, measuring and displaying sample concentrations using absorbance (according to Beer's law for specific path lengths) and creating user configurable methods can be done in a flash.

More important however, you can integrate this module's data acquisition capabilities into your existing analytical spreadsheet, thereby enabling you to acquire and analyze spectral data without ever leaving the Microsoft environment.

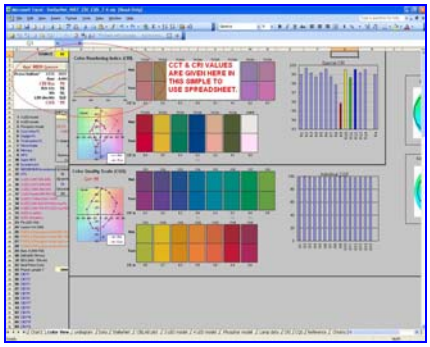
Create custom reports, calculate and graph absorbance or percent transmission, all at the push of a button. It's all here and more important, it's included with your StellarNet spectrometer.



Excel's VBA script functionality enables the user to query an instrument directly from Microsoft Excel. Data from the device is imported directly onto an Excel page for post data processing using user defined algorithms. Shown above is the main page of the module: visible are the dark, reference, and spectral traces and the spectrometer's configuration settings.



Above is the processed data graphics page of the module. Scope, absorbance, and transmission data is displayed simultaneously. Notice the noise below 400 nm in the absorbance and transmission curves. From looking at the scope mode data, you can quickly determine that this is due to the fact that there is no reference signal in this portion of the spectrum (and is therefore invalid). Adding a deuterium lamp would allow that spectral region to be measured.



CRI & CQS calculations are performed in a comprehensive spreadsheet written by the folks at NIST. We'll send you our free modified version that reads StellarNet spectrometers..

StellarNet Inc

14390 Carlson Circle, Tampa, Florida, 33626 USA
Voice: **+1-813-855-8687** Fax: **+1-813-855-0394**
www.StellarNet-Inc.com
ContactUs@StellarNet-Inc.com

www.StellarNet.us